PROSPECTIVE PAYMENT
ASSESSMENT COMMISSION

RURAL HOSPITALS UNDER MEDICARE'S PROSPECTIVE PAYMENT SYSTEM

CONGRESSIONAL REPORT

C-91-03

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This report was directed by Carol Carter. Major contributors include Sharon Arnold, Amy Bernstein, Kirsten Iversen, Jodi Korb, and Julian Pettengill. Jack Ashby and Deborah Williams also contributed to the report. Wylene Carlyle typed most tables; Delores Curtis, Molly Ryan, and Melissa Winkel put the manuscript into final format. We gratefully acknowledge the programming support and insights provided by Ben Steffen and his staff at ARC Professional Services Group. We would like to thank the staffs at the Assistant Secretary for Planning and Evaluation (HHS), the Bureau of Policy Development (HCFA), and HCFA Regional Offices for data shared with us on Sole Community Hospitals. Finally, we would like to thank Tracy Caprio at Lewin/ICF for answering our numerous questions about the isolated hospitals data file created under contract to ASPE.

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Executive Summary

The Senate Appropriations Committee requested that ProPAC investigate two issues related to Medicare payments to rural hospitals. First, the Commission was asked to summarize the changes made in policies since PPS was first implemented and to estimate how much more rural hospitals would have been paid had these policies been in place in the first year of PPS. Second, ProPAC was asked to analyze the impact of low volume of admissions on per case costs. ProPAC has used this request as an opportunity to step back and also examine several broader issues related to rural hospitals.

ProPAC found that had the 1991 policies been in place at the beginning of PPS, payments would have increased over 5 percent, and PPS margins would have been about equal for rural and urban hospitals. However, it is important to note that most of these policy changes were enacted in reaction to the relatively poorer performance of rural hospitals. Without this poor performance, it is very unlikely that all these policies would have been put in place at the beginning of PPS.

ProPAC was also asked to estimate the effect on payments of individual policy changes made since the beginning of PPS. Of the policy changes examined, modifications to the standardized amounts and the facility designations have had the greatest impact on payments to rural hospitals. Changes in the wage index and in disproportionate share policies had very small effects on rural hospital payments.

Because many other factors besides changes in PPS payment policy have had enormous effects on rural hospital performance, ProPAC also examined the impact of these other factors -- most notably, declines in admissions and slower growth in case mix. Between the first and sixth years of PPS, payments to rural hospitals were seriously eroded by the large declines in volume. In contrast, increases in payments to urban hospitals were supplemented by large increases in their case-mix indexes.

In order to estimate how rural hospitals fare under current policy, ProPAC modelled what payments would have been in 1989 under 1991 payment rules. This analysis suggests that median rural PPS margins would have been substantially higher under 1991 payment rules than they were in 1989, and would have been better than PPS margins for urban hospitals. Eliminating the urban/rural differential in the standardized amounts will increase rural PPS margins compared to urban hospitals still further. Total margins, a better measure of hospital financial viability, would have increased significantly for rural hospitals and are well above zero.

These findings indicate that the policies adopted by Congress have had their intended effect to improve rural hospital performance. These policy changes more than offset the large volume declines most rural hospitals experienced. The Commission believes that no further across-the-board payment adjustments for rural hospitals are warranted until the effects of all current policies, including the elimination of the differential, are known. The Commission is concerned, however, that the only hospitals groups that appear to have positive margins under PPS are those hospitals that benefit from special payment adjustments -- sole community, disproportionate share, and major teaching hospitals.

Because hospital performance continues to vary significantly, concerns were raised about two groups of hospitals that may warrant further consideration. First, certain design features of

PPS may disadvantage rural hospitals. The Commission found that volume declines are directly related to financial performance, primarily because of the presence of fixed costs. During the coming year, ProPAC will discuss the desirability of modifying payments to accommodate different proportions of fixed costs. The Commission also examined the use of national DRG weights for payments to rural hospitals. It found that while national weights do not systematically over- or underpay any hospital group, they may result in inaccurate payment to individual hospitals. Because modifying the weights would require a simultaneous adjustment in the standardized amounts, the Commission will consider rural- and urban-based DRG weights in the broader context of PPS reform in a subsequent report to Congress.

The second group of concern are those hospitals required to ensure beneficiary access to care. The sole community hospital (SCH) definition does not appear to identify hospitals that are different from other hospitals, nor does it identify hospitals that are the sole providers of care for their communities. Over the coming year, the Commission will consider alternative criteria for SCH designation based on beneficiary access. Other analyses indicated that, as a group, SCHs do not warrant additional protection. However, given the variation in performance within the group, there may be hospitals that do need additional payments to remain viable. In addition, given limited Medicare resources, the Commission will examine payment adjustments that would apply only to those hospitals required for access *and* that require additional financial assistance.

Stepping back from the narrow topic of hospital payments under PPS, the Commission considered several broad issues affecting rural hospitals. Underutilized services are expensive and may result in poorer patient outcomes. The Medicare program may want to consider incentives to encourage hospital downsizing and reconfiguration of services. While the Commission supports the concepts behind the Essential Access Community Hospital Program, it has concerns about several specific provisions. The Commission believes that this is but one program to achieve industry restructuring. Over the coming year, it will examine several state programs that might serve as models at the Federal level. Options to encourage physician location in rural areas and beneficiary use of local hospitals for routine care need to be considered. Current payment policies regarding transfers back to local hospitals for recuperative care also require further examination.

Beyond hospital payments, the Commission believes that reforms in outpatient and skilled nursing facility payments need to be evaluated for their impact on rural hospitals. Rural hospitals and beneficiaries are far more dependent on these services than their urban counterparts. Outpatient and skilled nursing facility payment reforms will influence rural hospital performance to a much greater extent than urban hospitals. In conclusion, the Commission notes that many of the problems faced by rural hospitals can not be solved by hospital payment policy. Their problems are broader and will require solutions beyond the Medicare program's resources and responsibilities.

Chapter 1

Summary

BACKGROUND

The Senate Appropriations Committee Report dated October 10, 1990 requested that the Prospective Payment Assessment Commission (ProPAC) provide information on two issues. First, ProPAC was asked to summarize the changes made to Medicare's prospective payment system (PPS) over time and to estimate the increase in payments if current payment policies had been in effect at the beginning of PPS. Second, ProPAC was asked to discuss the impact of low volume of admissions on hospital costs and payments. This report summarizes our findings on these and other related issues.

This chapter summarizes the Commission's findings. It begins with a brief discussion of the effects of changes made to Medicare payment policy. Then, it reviews the basic assumptions underlying PPS that may disadvantage rural hospitals and discusses design features that affect all hospitals. Last, it summarizes the analyses of sole community hospitals (SCHs). For each topic, there is a more complete discussion and accompanying tables in a subsequent chapter.

OVERVIEW OF FINDINGS

Since the beginning of PPS, rural hospital PPS margins have been lower than those for urban hospitals. Over time, rural hospital performance deteriorated, in large part due to their more significant decline in admissions. This poor financial performance, including many hospital closures, raised concerns about the viability of rural hospitals and access to care for Medicare beneficiaries. To improve the financial performance of rural hospitals, numerous changes in payment policies were enacted by Congress between 1984 and 1991.

If current Medicare payment policies had been in place in fiscal year 1984 and patient volume had remained at 1984 levels, payments to rural hospitals would have been 5.5 percent higher than actual payments. This increase in payments would have eliminated the difference in PPS margins between rural and urban hospitals.[1] If current policies had been in place in 1989, rural hospital would have fared better than urban hospitals.

These results indicate the payment policies in effect in 1991 have more than compensated for the considerable volume losses rural hospitals experienced. Therefore, the policies enacted by Congress appear to have had their intended impact of improving the financial performance of rural hospitals. And, while on average rural hospitals would have higher PPS margins than urban hospitals, all hospital PPS margins would have fallen

[1] The PPS margin measures a hospital's financial status under PPS by comparing the PPS payments received to Medicare-allowable inpatient operating costs. The margin indicates the extent to which PPS payments cover the costs of related inpatient services provided to Medicare beneficiaries. PPS margins do not indicate the overall financial condition of a hospital, since that depends on the total revenues and total expenses a hospital incurs in all its inpatient, outpatient, and nonpatient activities.

considerably since the beginning of PPS. The majority of both urban and rural hospitals would have negative PPS margins.

It is not possible to know exactly what the financial condition of rural hospitals will be in the next several years. The policies that have been implemented to date, together with the phased elimination of the differential between the other urban and rural standardized amounts, will continue to improve the overall financial performance of rural hospitals compared with urban hospitals. However, continued volume declines may offset the effects of these beneficial policies. Further, it should be noted that total margins for rural hospitals were positive in 1989 and were estimated to be even more positive under current rules. Until it sees how these opposing trends evolve, the Commission believes that no further across-the-board adjustments to improve rural hospital financial conditions should be made.

Though no broad rural adjustments appear necessary at this time, changes targeted at two types of problems might be warranted. First, PPS policies may need to be refined to improve the accuracy of payments to all hospitals. Comparison of national versus urban- and rural-based DRG weights showed that nationally-based weights are not biased against any particular group of hospitals. The analyses did show, however, that using national weights to pay rural hospitals results in large payment inaccuracies for specific hospitals. Initial examination of outlier payments suggests that lower outlier thresholds for rural hospitals would not benefit most rural hospitals, since these would be financed by lowering the standardized amounts. The Commission is nonetheless concerned that small, mostly rural, hospitals are exposed to more risk under PPS than other hospitals, and it will continue to study this aspect of the payment system.

The second category of possible changes would seek to improve the identification of and payments to hospitals required to ensure beneficiary access to care. Examination of sole community hospitals revealed few significant differences between SCHs and other rural hospitals. Further work is needed to improve the SCH criteria to identify the hospitals required to protect beneficiary access. In addition, even under 1991 payment rules, one quarter of SCHs would have had poor PPS margins in 1989. If these hospitals are required for access, more tailored payment policies may be warranted.

The Commission continues to be concerned that hospitals required to maintain beneficiary access may not be performing sufficiently well to remain open. ProPAC analyses showed that financial performance is directly tied to volume -- those hospitals with large volume losses had the largest deterioration in PPS margins. Over the next year, the Commission plans additional work to identify hospitals required for access reasons and to design payment policies to ensure their viability.

CHANGES IN MEDICARE PAYMENT POLICIES SINCE PPS WAS IMPLEMENTED

Between 1983 and 1991, numerous changes were made in PPS policy that affect rural hospitals. It is important to remember that current policies were adopted in response to hospitals' experience between 1983 and 1991. Many changes made during this period were

intended to increase the accuracy of the methods used to calculate PPS payments. Others, in reaction to the dramatic decline in rural PPS margins, were intended to improve the financial condition of rural hospitals. Had rural hospitals been doing better financially, it is unlikely that all of the 1991 policies would have been adopted, particularly those aimed at improving rural hospital financial performance. Because complete adoption of 1991 policies back in 1984 seems improbable, estimates of hospital experience in 1984 under 1991 rules represents an unlikely scenario.

This analysis was based on many assumptions more fully described in Appendix B. Because these assumptions only approximate actual experience, caution should be used in drawing conclusions based on them.

Applying 1991 Rules to 1984

ProPAC modelled 1991 payment rules and applied them to actual discharge data for 1984.[2] These simulated payments were compared with actual payments for 1984 to see how much more hospitals would have been paid had these policies been in place. Three alternative scenarios were modelled: (a) fully Federal rates -- as if the three-year transition had not applied, and without budget neutrality to hold payments to the level paid under the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA); (b) rates incorporating the transition but with no budget neutrality -- total payments could increase; and (c) rates incorporating both the transition and budget neutrality. Because the last scenario is the closest to the actual policies in place in 1984, it was the model used to estimate PPS margins.

The results of estimating 1991 policies on 1984 discharge data show that with the transition and budget neutrality provisions, payments to rural hospitals would have been more than 5 percent higher. This increase in payments to rural hospitals would have been funded by a 1.1 percent reduction in payments to urban hospitals. Fully implemented Federal rates would have yielded far more generous payments -- payments to rural hospitals would have been almost 23 percent higher, with small hospitals having the largest increase of any group (over 33 percent).

Assuming the policies closest to those actually in place in 1984 (that is, with transition and budget neutrality), rural hospital margins would have been almost equal to those for urban hospitals. Whereas actual 1984 margins showed a difference of over six percentage points (14.6 percent for urban hospitals versus 8.2 percent for rural), 1991 policy with the transition and budget neutrality would have narrowed this difference to less than one percentage point (urban margins of 14.2 percent versus rural margins of 13.4 percent.)

Impact of Individual Policy Changes

The Senate Appropriations Committee also requested estimates of the impacts of various individual policies. Previous work indicated that the change from hospital- to discharge-weighting of costs in determining the standardized amounts and the establishment of separate

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[2] A more complete discussion of this modelling effort is detailed in Chapter 2.

rural and urban outlier financing pools each increased payments to rural hospitals by 1-3 percent. Four of the most important policies affecting payments were chosen for this analysis: (a) changes made to the wage index; (b) changing the methodology to calculate the standardized amounts; (c) the increase in the number of hospitals classified as sole community, rural referral, and rural redesignated hospitals; and (d) the adoption and expansion of the disproportionate share adjustment.

The estimates assumed the current national rate and no budget neutrality. This version allows the best comparison of the policies by themselves, without the transition or budget neutrality to confound the results. It will, however, overstate what the effects of these policy changes would have been if they had been implemented in 1984.

Changes in the wage index would have made very little difference to overall payments (0.4 percent) and only a small difference in payments to rural hospitals. Its effects were predominately regional. Using deflated 1991 standardized amounts would have significantly increased payments to rural hospitals (over 16 percent.) The expanded categories of hospitals receiving special treatment would have increased payments to rural hospitals by over 6 percent. Most notably, payments to rural referral centers would have increased almost 22 percent. Finally, the disproportionate share adjustment, which did not exist in 1984, was beneficial primarily to urban hospitals. Rural hospital payments would have increased by less than one percent due to the disproportionate share hospital adjustment.

Applying 1991 Rules to 1989

Applying 1991 payment rules to 1989 discharges provides the best available estimate of current financial performance. The data reflect important volume declines that significantly affect performance while incorporating the most recent policies favorable to rural hospitals. Again, because numerous assumptions were made in modelling 1991 policy for 1989, the results are only suggestive of how hospitals are faring in 1991. For example, any changes in hospital behavior or discharges between 1989 and 1991 would directly affect these results.

ProPAC estimates that if fiscal year 1991 policies had been in effect in 1989, rural hospitals would have done significantly better than their urban counterparts. While the actual median 1989 PPS margin for rural hospitals was -3.5 percent, 1991 policies would have increased this margin to -0.5 percent. This compares with an estimated urban PPS margin of -3.4 percent. Changes in policies between 1989 and 1991, specifically the sole community hospital provisions of the Omnibus Budget Reconciliation Act of 1989 (OBRA 1989) and higher updates in 1990 and 1991, appear to have improved rural hospital PPS margins. The changes in the performance of sole community hospitals illustrates the dramatic improvement possible through targeted payment policies. Actual margins in 1989, prior to the new SCH payment policies, were -5.8 percent, while under 1991 rules they would have been 1.3 percent.

The policies adopted since the inception of PPS have achieved their overall objective of correcting the imbalance in financial status between rural and urban hospitals. Groups of hospitals that performed the best, in fact the only groups with positive PPS margins, are those benefitting from specific policies directed at them -- sole community, major teaching, and disproportionate share hospitals. The elimination of the differential in the other urban and

rural standardized payment amounts by 1995 will further improve the performance of rural hospitals relative to urban hospitals.[3] The effects of the differential may, however, be partially offset by other factors such as continued decline in volume, slower growth in the case-mix index, and the degree to which the 1982 or 1987 base year costs used in the payments to SCHs do not accurately reflect current hospital costs.[4]

Current policies did not, however, eliminate the wide variation in hospital performance, both within a hospital group and across groups. The range in estimated PPS margins within groups seemed to be as wide as actual 1989 performance, even though aggregate performance improved.

Examination of total hospital margins under 1991 rules indicated that, as a group, rural hospitals are doing at least as well as urban hospitals and so do not warrant additional protection. Estimated margins for rural hospitals were 3.7 percent, compared with 4.0 percent for urban hospitals. No hospital group had negative total margins.

The Effects of Other Changes

It is important to remember that payments to hospitals are a function of both the policies in place and the volume and mix of cases they treat. Between 1983 and 1989, Medicare discharges from rural hospitals declined almost 14 percent.[5] Thus, by 1989, while hospitals would have been paid more per case under current policies, volume declines would have eroded this improved position. This is because PPS is a per case payment system -- volume declines result in a corresponding decrease in payments. Yet, costs do not decrease proportionately. Therefore, margins will deteriorate when volume declines.

ProPAC estimates that volume declines for all hospitals resulted in a 9 percent reduction in payments. Countering this reduction was a 17 percent increase in payments due to changes in the case-mix index. Hospitals overall had their payments increase by 7.6 percent as a result of these changes. These effects were very different for urban and rural hospitals. Urban hospital payments increased 11 percent, while rural hospitals payments declined by over 8 percent. For rural hospitals, reductions in payments due to the dramatic declines in volume (-16 percent) were only partially offset by increases in their case mix indexes (12 percent).

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[3] Eliminating the differential in 1989 and paying under 1991 rules would have increased rural margins to 4.2 percent, from -0.5 percent when only 1991 policies were in effect.) Urban hospital PPS margins would be reduced from -3.4 percent (actual 1989) to -4.1 percent.

[4] Increases in the case-mix index may result from either changes in patient resource use or refinement of medical record documentation and coding practices. Changes in patient resource use may be due to treating more severely ill patients or providing more complex services. Both reflect real changes in the costliness of treatment. Conversely, refinement of medical record documentation and coding practices may result in higher payment but do not reflect changes in treatment costs.

[5] Rural hospitals have lost even more non-Medicare discharges. Total discharges declined over 20 percent between 1983 and 1989.

Implications for Future Policy Changes

Estimates of current rural hospital performance, both under PPS and overall, indicate that no further across-the-board adjustment for rural hospitals is warranted at this point in time. The elimination of the differential between the other urban and rural standardized amounts will further improve rural hospital PPS margins. Continued volume declines, slower growth in case-mix indexes, and the aging of the base year (1987) used in SCH payment calculations will be offsetting factors. The distribution of margins indicates that many rural hospitals continue to perform poorly, even under current rules. ProPAC plans to examine those hospitals performing poorly to assess if these hospitals are required to maintain beneficiary access. If so, then further, more targeted payment adjustments may be warranted.

HOSPITALS REQUIRING ADDITIONAL CHANGES TO PPS POLICIES

Although rural hospitals as a class do not appear to require additional protection, two types of policy changes may be desirable. First, several changes could be made to minimize the biases in the current payment system. Some of these biases disproportionately affect small and rural hospitals; others affect all hospitals and deserve a broader evaluation of PPS that is beyond the scope of this report. Each of these problems is summarized below and more completely discussed in Chapter 3.

Second, certain hospitals needed to maintain beneficiary access may require additional protection. Results summarized above indicate that as a group, SCHs seem to have benefitted considerably from the OBRA 1989 provisions. However, examination of the distribution of PPS margins indicate that there continues to be wide variation in the performance of SCHs, with some of them doing quite poorly. ProPAC is concerned that some SCHs that are required for access continue to experience severe financial stress. Likewise, to ensure equity under the payment system, there may be a group of hospitals currently designated as SCHs that do not warrant protection. ProPAC's findings on SCHs are described more fully in Chapter 4.

Design Features that May Disadvantage Rural Hospitals

When PPS was implemented, there was considerable concern that many small, mostly rural, hospitals would be penalized under a national, per case payment system. Although the prospective payment system was intended to establish rates adequate to cover the costs of efficient care, questions remain about the fairness of these rates for hospitals with low volume. In addition, rural hospitals have experienced disproportionately large declines in the volume of inpatient discharges. The declines in volume, in combination with the payment system's design, contributed to poor financial performance.

The most basic volume question centers on the minimum number of cases required by a hospital for some of the key premises of PPS to operate. Low volume hospitals may not be able to obtain sufficient protection from the averaging between cases implicit under PPS. As a result, these hospitals may face greater financial risk than other hospitals under Medicare's fixed rate payment system.

Another potential problem centers on the impact of volume declines on per case costs. A fixed payment per case assumes that costs change proportionally to any change in volume. However, a large portion of hospital costs is fixed and these costs do not change with changes in volume. ProPAC sponsored research indicates that a 10 percent decline in Medicare admissions in rural hospitals results in a 10 percent decline in payments, but only a 4.7 percent decline in total costs.[6]

The proportion of fixed costs varies by hospital group: rural hospitals and hospitals with low occupancy have higher fixed costs.[7] For example, in low occupancy rural hospitals, fixed costs make up 65 percent of total costs, whereas in high occupancy urban hospitals they are only 17 percent. Because payment rates are based on average hospital costs, low occupancy hospitals are likely to have payments that do not cover their higher than average costs per case.

ProPAC analysis of the relationship between changes in volume and financial performance indicates that between 1984 and 1988, hospitals with the largest volume declines had the largest declines in their financial condition. This finding was consistent for both total discharges and total operating margins, and Medicare discharges and PPS margins. In addition, a detailed analysis of cohorts of hospitals (based on their volume patterns) showed that hospitals with the largest declines had the worst margins. Their poor performance was due to their costs per case rising much more rapidly than their revenues per case. For example, rural hospitals with 10 percent volume declines for three out of four years had -10 percent PPS margins in 1988. Their PPS costs per case rose 58 percent between 1984 and 1988, while their payments per case increased only 27 percent. Their performance was much worse than hospitals with small volume declines.

ProPAC will continue to examine the impact of low volume on hospital financial performance. The Commission believes that those hospitals required to maintain access should be protected against the high per case costs resulting from low volume. Two basic policy directions should be assessed: revising the current volume adjustment, and refining the method of payment for SCHs. Because each addresses slightly different objectives, the Commission will consider the purpose and method of each separately.

Another potential bias affecting rural hospitals has to do with the DRG weights. Currently, the DRG weights are based on all cases and are dominated by the cases treated in urban hospitals, since urban cases comprise almost 80% of Medicare discharges. Comparison of national versus rural- and urban-based weights revealed no systematic bias against any group of hospitals. Within hospital groups, however, payments and margins for some individual hospitals would be quite different, indicating significant over- and under-payments may occur in the current system. The Commission will consider the tradeoffs involved in making payments more accurate.

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[6] Hadley J. and S. Zuckerman, *Hospital Cost Variations Under PPS*, ProPAC Extramural Technical Report No. 90-09, August 1990, Table 7-4.

[7] Op.cit., Table 7-5.

The last potential source of bias discussed in the report relates to the definition of outliers. A small number of cases undermines a hospital's ability to absorb the losses associated with outliers, thereby increasing the hospital's vulnerability. Examination of outlier payment policy and possible corrections was considered beyond the timeframe and scope of this report. However, it is clear that this issue centers on the degree of risk rural hospitals are to be exposed to. While the thresholds could be lowered to qualify more cases as outliers, they would be financed by lower standardized amounts for all rural hospitals. This tradeoff between payments for outliers and the standardized amounts needs to be balanced in considering how to define outliers for rural hospitals.

Design Problems Affecting All Hospitals

In addition to the PPS design features that may be biased against rural hospitals, two elements of the original design may create inaccurate payments to all hospitals. The first of these is the use of a fixed labor share for all DRGs for all hospitals. It is likely that the portion of total costs attributed to labor costs varies across different types of cases and different types of hospitals. Yet a uniform labor share is used to adjust total costs for differences in labor costs. This approximation could result in systematic over- and under-payments.

The second inaccuracy in PPS is the imprecise definition of labor markets used to adjust labor costs for local differences in wages. These markets do not reflect actual labor markets, ignore intrastate variations in wage levels across rural areas, and create boundary inequities between rural and urban areas. The large number (over 900) of rural hospitals that have successfully sought redesignation is testimony to the deficiencies of the market areas and the perceived inequities they created. The impact of rural redesignated hospitals on rural and urban standardized amounts will be a topic of future analytic work.

Both of these design problems were considered beyond the scope and timeframe of this report. However, they are included in ProPAC's analytic agenda for the upcoming year. The Commission will continue to keep Congress and HCFA abreast of its findings.

Hospitals Required for Beneficiary Access

ProPAC has consistently stated that beneficiary access to care should determine payment policy for rural hospitals. If hospitals are required to maintain access to care, they should be protected through special payment adjustments. In addition, the Commission believes that Medicare is not responsible for underwriting all losses associated with low utilization at all hospitals. Hospitals not required to maintain access should be encouraged to assess their future roles in delivering care to their residents and to reconfigure their services to meet actual demand.

Given the importance of protecting certain hospitals for access reasons, the Commission examined hospitals currently designated as sole community hospitals. For lack of a better and feasible alternative, SCH designation is a proxy for those hospitals required for access.[8] To ensure SCH viability, they currently receive special treatment.

The analyses reveal that SCHs are not very different from other rural hospitals. Characteristics such as average daily census, market share, occupancy, and service mix look similar to other rural hospitals of the same size. In addition, their financial performance was also quite similar to non-SCH hospitals. These findings raise questions about the ability of the criteria to identify hospitals required for access. The Commission was also concerned that most SCHs are not the primary providers of care to Medicare beneficiaries in their market areas.[9] If these hospitals are not acting as the primary providers of care in their communities, the purpose of the SCH designation is questionable.

The analysis of grandfathered hospitals found that these hospitals are not significantly different from other SCHs or other rural hospitals.[10] To the extent that SCHs continue to be granted protection, these hospitals appear to warrant the same consideration.

These findings underline the Commission's interest in refining the SCH criteria. While these criteria appear reasonable, they do not seem capable of distinguishing hospitals required for access reasons from other rural hospitals. The Commission encourages additional work on the criteria, particularly for hospitals between 25 and 35 miles from the nearest hospital. It also encourages work to define access from the beneficiary's perspective.

The Commission agrees with current PPS policies protecting hospitals required for access in isolated areas but believes that the methods for doing this could be improved. The current volume adjustment may not target hospitals that should be protected and it may not represent the best method to shelter hospitals from the consequences of chronic low volume. Two different methods need to be considered: (a) changing the method of payment for these hospitals, or (b) modifying the current volume adjustment. The Commission will continue its work to identify hospitals that warrant protection and to improve payment policies for them.

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[8] Given existing data limitations, SCHs represent a reasonable approximation of those hospitals required to ensure access. This definition incorporates key factors of isolation: distance or travel time to the nearest hospital, serving as the primary provider of care, and severe weather conditions inhibiting travel to other hospitals.

[9] The Medicare market share is only one of three ways in which a hospital can meet the market share requirement. The other two include: market share of 75 percent for all discharges; or, certification from the Peer Review Organization or Fiscal Intermediary that the hospital could have met the market share requirement had it offered specialized services.

[10] The Commission defined grandfathered hospitals as those SCHs not meeting any of the current criteria yet paid under these provisions. Because earlier definitions were more stringent, any hospital meeting earlier definitions would meet later definitions.

CONCLUSIONS

The Commission believes that no across-the-board adjustment should be implemented for rural hospitals until all current policies are in place and their full effects can be evaluated. Examination of the distribution of their performance, however, suggest that certain subgroups of rural hospitals continue to fare poorly under PPS. Additional analyses are needed to determine if targeted payment adjustments are warranted.

There are two groups of hospitals the Commission is particularly concerned about. First, some hospitals are consistently disadvantaged because of the basic structure of PPS. Features that are beyond the control of the hospital warrant correction. Conversely, Medicare has more limited responsibility to adjust for other features that are within the hospital's control. Medicare need not shoulder the costs of keeping inappropriately scaled institutions open. Rather, its policies should actively encourage appropriate downsizing of capacity and service offerings.

The second group of hospitals of concern are those required for beneficiary access. Current payment policies appear adequate to protect SCHs. However, it is not clear that SCHs defined using current criteria are always those hospitals necessary to assure access. The Commission will continue to examine more effective ways to selectively protect those hospitals required for access.

Ensuring the financial viability of rural hospitals that are not required for access presents more difficult policy considerations. On the one hand, maintaining overcapacity in the hospital sector is an expensive policy and may not always result in high quality medical care. The Commission believes that under-utilized hospitals need to evaluate their present role and begin restructuring their services and capacity to more accurately match the needs of their communities.

It is clear, based on current analyses, that there is significant overcapacity in rural areas. Despite this, there are concerns about access to appropriate care for all beneficiaries. Restructuring hospital service delivery is one option to improve the quality of care delivered, ensure access, and reduce expensive redundancy. The Medicare program should consider options to best achieve restructuring of these facilities. The Commission supports the concept of the Essential Access Community Hospital (EACH) program, though it has several concerns regarding its specific provisions. It believes, however, that the EACH program is but one example of the kind of approach required to tailor hospital services to meet the needs of the local communities. Many states have developed programs that serve as models for restructuring the delivery system. The Commission plans to examine these state programs for effective models to consider at the national level.

Medicare should also consider methods to encourage rural residents to use rural hospitals for those services that can safely and effectively be treated at these hospitals. The current use of rural referral and urban hospitals for cases that could be treated at rural hospitals is more expensive for both the Medicare program and beneficiaries. Appropriate use of urban or rural referral hospitals may lower both program and personal costs.

Medicare's hospital payment policies cannot, however, solve the array of problems affecting the delivery of rural health care. Rural hospital policy will also need to reach beyond payment considerations and address broader issues such as the attraction and retention of physician and allied health personnel, ready access to specialists, the transfer and referral of cases beyond the capability of the local hospital, and the adequate distribution of other health resources. In addition, as Medicare considers payment reform of outpatient and skilled nursing services, the impact of these reforms on rural hospitals will need to be carefully evaluated.

Restructuring rural hospitals and including them in networks that could include urban hospitals may help address some of these broad issues. Small hospitals would offer only those services they could deliver efficiently and with high quality care. Services beyond their scope would be offered by another facility in the network. If integrated into a system of care, physicians may feel less isolated and be encouraged to locate in rural areas. Transfer arrangements would ensure that appropriate services are readily available at another site. Finally, this level-of-care approach to rural health care delivery would reduce program and beneficiary costs.

Chapter 2

Medicare Payment Policy Changes and Hospital Financial Performance

Compared to urban hospitals, rural hospitals have experienced poor financial performance (as measured by PPS operating margins) during the first six years of PPS. This relatively poor performance can be attributed to several factors, including certain design features of PPS and rapid changes in the demand for inpatient care in rural hospitals. Specific design features of PPS that have differentially affected rural, as opposed to urban, hospitals include: different standardized payment amounts, the method of financing additional payments for outlier cases, and special treatment of sole community, Medicare-dependent, and referral hospitals. Many of these features of PPS payment policy have been modified over the years, partly in response to the poor performance of some groups of hospitals.

The design of PPS has affected the financial status of rural hospitals in other ways as well. Because PPS is a per case payment system, a decline in the volume of Medicare discharges results in a proportional reduction in PPS payments. Due to fixed costs, however, the reduction in PPS operating costs due to treating fewer cases is less than proportional to the decline in volume. The volume of Medicare discharges has fallen much more in rural than urban hospitals since the implementation of PPS. Consequently, volume declines have had a stronger adverse impact on rural hospitals. The relationship between changes in volume and financial performance is described in Appendix A. Chapter 3 includes a discussion of the impact of changes in volume on costs and payments.

In addition, payments under PPS are directly affected by a hospital's case-mix index (CMI), which reflects the relative costliness of its mix of Medicare cases. In general, hospitals' CMIs have increased rapidly, resulting in proportionately higher PPS payments. To the extent that this reflects a shift in the mix of Medicare cases toward more costly cases, and proportionately higher costs per case, higher CMIs will not affect financial performance. A significant portion of historical CMI change, however, has been due to improved medical record documentation and coding practices (upcoding). Therefore, increases in CMIs have contributed positively to hospitals' financial performance under PPS because they have resulted in increased payments, without fully proportional increases in costs. The CMIs of rural hospitals have not increased as rapidly as CMIs for urban hospitals. Thus, rural hospitals may not have benefitted as much from the financial advantages of upcoding as urban hospitals have.

The analyses presented in this chapter disentangle these direct and indirect effects of PPS on the financial status of rural hospitals. This chapter highlights the impact of changes in Medicare payment policy on all hospitals, and rural hospitals in particular. The chapter begins with a description of major policy changes enacted by Congress since the beginning of PPS. Many of these policy changes were designed, at least in part, to help rural hospitals. The financial performance of rural hospitals between the first and sixth years of PPS is then briefly described.

The remainder of the chapter focuses on estimates of the impact that these policy changes would have had on rural hospitals' PPS payments and PPS margins if these policies had been in effect at the beginning of PPS in fiscal year 1984 and, as a proxy for current

performance, in the sixth year of PPS. This analysis is divided into three parts. The first set of estimates shows what would have happened to PPS payments, PPS operating margins, and total margins if current policies (fiscal year 1991 policy) had been in effect during hospitals' first year under PPS (PPS 1). In addition, this set of estimates examines the impact of selected individual policy changes.

The second set of estimates shows what would have happened to payments and PPS margins if fiscal year 1991 policy had been in effect during hospitals' sixth year under PPS (PPS 6). These estimates permit an assessment of the impact current policy would have had in the most recent year for which actual hospital cost and discharge data are available. They also permit a partial assessment of the roles played by changes in Medicare discharge volume and changes in case mix during this period in influencing hospital financial performance under PPS. Except for the average annual updates for fiscal year 1985 through fiscal year 1989, PPS policies are essentially held constant between the estimates for PPS 6 and those for PPS 1. Therefore, differences in aggregate PPS payments between the two sets of estimates reflect the combined effects of the average annual updates and other factors such as changes in Medicare discharge volume and changes in case-mix.

The third set of estimates attempts to show what would have happened in PPS 6 if the differential between the rural and urban standardized payment amounts had been eliminated as scheduled for fiscal year 1995.

MAJOR CHANGES IN POLICY SINCE THE BEGINNING OF PPS

PPS was intended to compensate both rural and urban hospitals for the reasonable costs of providing inpatient care, while creating incentives for efficiency. Historically, Medicare allowable costs per discharge were lower in rural hospitals than in urban hospitals. Their lower costs reflected differences in local wage rates, case-mix, availability of technology intensive services and facilities, and practice patterns. In enacting PPS, Congress established a lower standardized payment amount for rural hospitals to avoid creating large windfall gains for these hospitals. In the first few years of PPS, the rural standardized amount was about 20 percent lower than the urban standardized amount (see Table 2-1).

While all hospital groups experienced extraordinarily high PPS margins in the first two years of PPS, margins for rural hospitals were only about half as high as those for urban hospitals. In response to perceived inequities in financial performance among many hospital groups, Congress enacted a series of major policy changes to PPS. Many of these changes were directed toward rural hospitals; other changes were not targeted at rural hospitals but affected them indirectly.

Table 2-1. Standardized Amounts, Fiscal Year 1984 to Fiscal Year 1991

	FY 1984	FY 1985	FY 1986[a]	FY 1987		FY 1988[a]	FY 1989	FY 1990[b]	FY 1991[c]
					Large urban	$3,120.10	$3,215.17	$3,396.56	$3,502.58
Urban	$2,837.91	$2,985.05	$2,987.31	$2,970.31	Other urban	3,104.73	3,183.85	3,342.79	3,447.13
Rural	2,264.00	2,381.39	2,370.22	2,449.91	Rural	2,712.16	2,834.71	3,107.20	3,219.17
Differential	20.2%	20.2%	20.7%	17.5%		12.9%[d]	11.4%[d]	7.8%[d]	7.3%[d]

[a] The standardized amounts displayed are the rates in effect at the end of the fiscal year.

[b] The standardized amounts displayed are the rates in effect as of January 1, 1990.

[c] The standardized amounts displayed are the rates in effect as of January 1, 1991.

[d] Represents the differential between the average urban standardized amount and the rural standardized amount.

SOURCE: Fiscal year 1984 - 48 *Federal Register* 39763, September 1, 1983; fiscal year 1985 - 49 *Federal Register* 34777, August 31, 1984; fiscal year 1986 - 50 *Federal Register* 35715, September 3, 1985; fiscal year 1987 - 51 *Federal Register* 42232, November 24, 1986; fiscal year 1988 - 53 *Federal Register* 11134, April 5, 1988; fiscal year 1989 - 53 Federal Register 38543, September 30, 1988; fiscal year 1990 - 54 *Federal Register* 53755, December 29, 1989; and 56 *Federal Register* 576, January 7, 1991.

As a result of these changes, the differential between the rural and urban standardized amounts has narrowed over time to 7.3 percent in fiscal year 1991. As described below, this narrowing is primarily due to three specific changes: shifting from hospital- to discharge-weighting in the calculation of the standardized amounts; separate updates for rural and urban hospitals; and the creation of separate pools for financing outlier payments. The provisions of OBRA 1990 require that the differential be eliminated by 1995 through higher updates to rural hospitals.

These and other important policy changes were enacted for two primary reasons. First, some changes in policy were adopted to correct perceived inequities in the initial design of PPS, or flaws in the initial data used to implement the payment system. For example, changes in the source of data and method of calculation of the area wage index, the financing of extra payments for outlier cases, and discharge-weighting of the standardized payment amounts, were adopted for these reasons.

Second, Congress also attempted to help hospitals where access to care for Medicare beneficiaries was believed to be threatened. Policies adopted for access reasons included provisions regarding sole community hospitals (SCHs), rural referral centers (RRCs), and small rural Medicare-dependent hospitals (MDHs, rural hospitals with less than 50 beds for which Medicare patients account for more than 60 percent of total inpatient days or total discharges).[1] Policies regarding teaching and disproportionate share hospitals were also adopted, at least in part, for access reasons.

Each of the major policy changes adopted since the beginning of PPS is briefly described below.

Wage Index Changes

HCFA periodically surveys PPS hospitals to collect data on total labor compensation (e.g., wages, salaries and fringe benefits) and paid hours of employment. These data are used to

[1] A small rural Medicare-dependent hospital is defined as a rural hospital with fewer than 50 beds in which Medicare's share of days or discharges exceeds 60 percent.

compute a separate wage index for each urban or rural labor market area.[2] The wage index for a hospital's labor market area is used to adjust the labor-related portion of its standardized payment amount, so that hospitals located in labor market areas where wage rates are relatively high are fairly compensated for the higher prices they face in the local marketplace. Rural areas tend to have lower wage indexes than urban areas because the cost of living is lower.

The wage index for fiscal year 1984, fiscal year 1985 and most of fiscal year 1986 was based on average wages and salaries per employee calculated from 1981 hospital data submitted to the Bureau of Labor Statistics. Until fiscal year 1986, the wage index did not account for differences among labor market areas in the proportion of full- and part-time labor. Consequently, before fiscal year 1986, hospitals located in areas with a high proportion of part-time employees tended to have wage indexes that understated the true level of average hospital wage rates in their area. In fiscal year 1986 and fiscal year 1987, the wage index was based on data from a HCFA survey of hospital wages and paid hours for 1982 that accounted for part-time and full-time labor.

The wage index for fiscal year 1988 and fiscal year 1989 was based on a blend of 1982 and 1984 data from HCFA surveys. In fiscal year 1990, the index was based entirely on the HCFA survey data for 1984. The wage index was revised again in fiscal year 1991, based on HCFA survey data for 1988, to include allocated home office costs and employee fringe benefits in the calculation of the index.

Differential Updates

Beginning in fiscal year 1988, rural hospitals were granted higher updates than urban hospitals to close the gap in PPS financial performance. In addition, in fiscal year 1991 a higher update was given to rural hospitals to begin to eliminate the differential in the standardized amounts between rural and other urban hospitals by fiscal year 1995.

Outlier Financing

Prior to fiscal year 1987, the standardized amounts for urban and rural hospitals were reduced by the same percentage (generally about 5 percent) to finance additional payments for outlier cases. Since outlier cases and payments tend to be concentrated in urban hospitals, however, the additional payments received by urban hospitals were substantially greater than the amount they contributed to the outlier financing pool. Conversely, the additional payments received by rural hospitals were substantially smaller than the amount of their contribution to the outlier financing pool.

In fiscal year 1987, Congress established separate outlier financing pools for urban and rural hospitals. The urban and rural standardized amounts were reduced by separate factors reflecting the amount of outlier payments each group was expected to receive. This meant that payments to rural hospitals increased (by about 3 percent), because their standardized amount

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[2] Urban labor market areas are defined by Metropolitan Statistical Areas (MSAs) or New England County Metropolitan Areas (NECMAs). Rural labor market areas are defined to include all nonmetropolitan counties in each state.

was reduced less than previously. The standardized amount for urban hospitals, however, was reduced more and their payments decreased (about 0.4 percent).[3]

Discharge Weighting

Until fiscal year 1988, the standardized amounts were based on hospital-weighted average standardized costs in the base year (1981), updated to the year of payment. This meant that all hospitals were equally represented in the calculation of the average standardized cost per case, regardless of their number of Medicare cases.

Beginning in fiscal year 1988, Congress required the Secretary of HHS to compute the standardized amounts taking into account each hospital's relative share of total PPS discharges. Since larger hospitals tend to have more cases and higher costs per case, the standardized amounts increased. Moreover, the standardized amounts for rural hospitals increased more than the standardized amounts for urban hospitals, because the distribution of cases was more skewed among rural hospitals (with higher cost cases being more concentrated in larger institutions) than among urban hospitals. However, Congress also required the Secretary to make this change budget neutral, so that aggregate payments to PPS hospitals after the change could not be either greater or smaller than the aggregate payments they would have received under the previous policy. This was accomplished by applying a budget neutrality factor to reduce both standardized amounts enough to fully offset the aggregate increase in payments that otherwise would have occurred. As a result, the rural standardized amount increased 1.2 percent, financed by a 0.2 percent reduction in the urban standardized amount.[4]

Rural Referral Centers

Since the beginning of PPS, rural referral centers have been paid on the basis of the urban standardized amount adjusted by the wage index for the area in which they are located (generally, the statewide rural wage index for their state). In the first year, only a handful of hospitals that had 500 or more beds and were located in a rural area received special treatment as referral centers. However, Congress has substantially liberalized the definition of a referral hospital over time. By fiscal year 1991, about 250 hospitals qualified for referral center status and higher payments. Since fiscal year 1988, referral centers have been paid on the basis of the standardized amount for other urban areas.

Sole Community Hospitals

For the first seven years of PPS, a SCH was paid a blended rate based on 25 percent of the Federal regional rate in its Census region and 75 percent of its updated base year cost per discharge (1982). Effective April 1, 1990, Congress mandated more generous payment policies. Since then, a sole community hospital or a small rural Medicare-dependent hospital is paid the greater of payments computed using its updated base year cost per discharge for 1982, its

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[3] These impacts were calculated from the outlier reduction factors listed in the *Federal Register* vol.51, no.226, November 24, 1986, p. 42231.

[4] *Federal Register*, vol.52, no.169, September 16, 1987, Table I, p. 33139.

updated cost per discharge for 1987, or the PPS Federal rate. The number of hospitals designated as SCHs has roughly doubled to about 600 since the beginning of PPS in fiscal year 1984.

Small Rural Medicare-Dependent Hospitals

Beginning in fiscal year 1990, Congress established special payment policies for small rural Medicare-dependent hospitals. In fiscal year 1991, about 500 rural hospitals qualified for designation as an MDH. These hospitals are paid according to the same rules as sole community hospitals.

Rural Redesignated Hospitals

Beginning in fiscal year 1989, Congress mandated that the Secretary redesignate certain rural counties as urban counties. The affected rural counties are adjacent to two or more metropolitan statistical areas (MSAs) and meet certain standards regarding the percentage of their employed residents who commute to the adjacent MSAs for employment. Hospitals located in qualifying counties are paid on the basis of the standardized amount applicable to the MSA to which the largest proportion of their employed residents commute for employment. These hospitals also may benefit from having their payments adjusted by a wage index that is higher than the statewide rural wage index that would otherwise apply.

Beginning in fiscal year 1992, hospitals may be reclassified to an adjacent urban or rural area for purposes of their wage index, standardized amount, or both. In OBRA 1989, Congress established the Medicare Geographic Classification Review Board (MGCRB) to review hospital requests for reclassification. As of August 30, 1991, almost one-third of all rural hospitals (729) had been reclassified to another urban or rural area (75 percent for the wage index only, 11 percent for the standardized amount only, and 14 percent for both). According to the Health Care Financing Administration, payments to these hospitals in fiscal year 1992 would increase about 8 percent due to reclassification alone. The reclassified hospitals are not considered in these analyses.[5]

Disproportionate Share Adjustment

Beginning in fiscal year 1986, Congress required the Secretary to make additional payments under PPS to hospitals that serve a disproportionate share of low-income patients (disproportionate share hospitals). Until recently, few rural hospitals qualified for this adjustment. However, starting in April 1990, changes in policy made more rural hospitals eligible for the disproportionate share hospital (DSH) adjustment. In fiscal year 1991, rural hospitals as a group received only about 0.8 percent of their total PPS payments from the DSH adjustment. Rural hospitals that qualified for the adjustment, however, received about 5.2 percent of their total PPS payments from this source.

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[5] Note that the estimates of PPS payments, PPS margins and total margins presented later in this chapter address the impact of FY 1991 policy. Since the reclassification decisions of the MGCRB do not take effect until the beginning of FY 1992, the effects of these decisions are excluded from the estimates.

Indirect Medical Education Adjustment

Since the beginning of PPS, additional payments have been made to hospitals that operate approved graduate medical education programs. These additional payments were intended to compensate teaching hospitals for the higher indirect costs of physician training programs. Initially, payments were increased by a factor of 11.59 percent for each 0.1 in the hospital's ratio interns and residents per bed.[6] In fiscal year 1986 Congress reduced the teaching adjustment factor from 11.59 percent to 8.1 percent to fund additional payments to DSHs, and to achieve budget savings. In fiscal year 1988, Congress again reduced the teaching adjustment factor from 8.1 to 7.7 percent, its current level. In fiscal year 1991, the indirect medical education (IME) adjustment accounts for about 5.5 percent of total PPS payments to all hospitals, but almost 21 percent of PPS payments for major teaching hospitals.

THE FINANCIAL PERFORMANCE OF RURAL HOSPITALS PPS 1 - PPS 6: THE IMPETUS FOR POLICY REFORM

During the first six years following the implementation of PPS, rural hospitals as a group have performed consistently worse than urban hospitals.[7] PPS operating margins for all hospitals declined from a median of 11.6 percent in PPS 1 to -3.2 percent in PPS 6 (see Table 2-2).[8] Rural hospitals have experienced a similar decline in median PPS margins, from 8.2 percent in PPS 1 to -3.5 percent in PPS 6. As shown in Appendix A, the average rural hospital had a negative PPS operating margin beginning in PPS 3. The average urban hospital did not have a negative PPS operating margin until PPS 5.

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[6] The adjustment enacted by Congress was double the empirical estimated percentage.

[7] The financial performance of hospitals between PPS 1 and PPS 6 is described in Appendix A. However, the financial performance measures in the Appendix differ from those reported in this chapter. The hospital PPS margins contained in the Appendix are based on hospital-weighted means, while the margins reported here are based on medians. The median margin is hospital margin value that divides the margin distribution in half; 50 percent of all hospitals have a margin value that is higher than the median, and 50 percent have value lower than the median. The hospital-weighted mean margins reported in the Appendix show the simple average of all hospital margin values with all hospital values weighted equally.

[8] The PPS operating margin compares PPS payments to Medicare-allowable inpatient operating costs. It excludes the cost of capital. It also excludes costs and revenues associated with the operation of medical education and training programs and other activities unrelated to the provision of inpatient acute care services (outpatient care, operation of parking lots, etc.). Thus, it provides a measure of how well the average hospital is paid for the costs that prospective payment is intended to cover.

Table 2-2. Actual Median PPS Margins in PPS 1 and PPS 6

Hospital Group	PPS 1[a]	PPS 6[b]
All hospitals	11.6%	-3.2%
Urban	14.6	-2.9
Rural	8.2	-3.5
Rural referral	9.2	-2.8
Sole community	8.1	-5.8
Other rural	8.0	-2.9
Major teaching	18.6	7.0
Other teaching	15.3	-1.6
Non-teaching	10.5	-4.1
Disproportionate share:		
Large urban	15.9	0.4
Other urban	14.5	0.5
Rural	9.0	1.1
Non-disproportionate share	10.7	-4.4
Urban <100 beds	12.7	-2.8
Urban 100-199 beds	14.3	-4.3
Urban 200-299 beds	14.8	-3.1
Urban 300-399 beds	15.6	-2.8
Urban 400-499 beds	15.4	-0.6
Urban 500+ beds	16.9	-0.5
Rural <50 beds	6.7	-2.1
Rural 50-99 beds	9.0	-3.9
Rural 100-149 beds	8.5	-4.7
Rural 150-199 beds	7.9	-4.1
Rural 200+ beds	9.0	-5.2
Voluntary	12.4	-2.3
Proprietary	11.9	-6.5
Urban government	13.9	1.3
Rural government	7.2	-4.6

[a] Based on 4,475 hospitals that had data in the MedPAR file for fiscal year 1984 and Medicare Cost Report data for PPS 1; excludes hospitals in Maryland, Massachusetts, New Jersey, New York, and Puerto Rico.

[b] Based on 4,510 hospitals that had data in the MedPAR file for fiscal year 1989 and Medicare Cost Report data for PPS 6; excludes hospitals in Puerto Rico, Maryland, and the Finger Lakes demonstration (New York).

SOURCE: ProPAC analysis of MedPAR data for fiscal years 1984 and 1989, and Medicare Cost Report data for PPS 1 and PPS 6.

Although all groups of rural hospitals had median margins below the national median in PPS 1, performance varied widely by hospital group. Small rural hospitals (those with fewer than 50 beds), had a median margin of only 6.7 percent in PPS 1, compared to the overall median of 11.6 percent. Other rural hospitals (not referral centers or sole community hospitals) had a median margin of 8 percent. By the sixth year of PPS, the median margins for all rural hospitals and all urban hospitals were substantially closer (-3.5 percent compared to -2.9 percent). However, the median margin for sole community hospitals (-5.8 percent) was still substantially below the national median (-3.2 percent). Conversely, rural hospitals with fewer than 50 beds were doing comparatively well by PPS 6, with a median margin (-2.1 percent)

above the national median (-3.2 percent). It is important to note, however, that the median margin for all hospitals was negative by PPS 6, indicating that PPS revenues for most hospitals were falling below Medicare allowable operating costs. Thus, many hospitals were performing poorly under PPS, especially relative to the early years of the program.

The across-the-board declines in PPS margins are partly due to the large volume declines that have occurred both before and since the onset of PPS. Rural hospitals, particularly small ones, have experienced much greater volume declines than urban hospitals. It is also important to note that the decline in volume was not limited to Medicare patients, but was actually greater for non-Medicare patients. According to the American Hospital Association's annual survey of hospitals, total hospital admissions decreased over 27 percent in rural hospitals from the 1983 to 1989, while admissions for urban hospitals declined only 10 percent during the same period.

The relatively poor performance of some groups of rural hospitals under PPS may also reflect their inability to hold down costs, particularly in the face of large declines in volume (see Table 2-3). The average rural hospital had a higher increase in its case-mix adjusted operating costs per case (41 percent) compared with the average urban hospital (39 percent.) The average small rural hospital (under 25 beds) had the largest increase (47 percent), reflecting larger losses in volume. The relationship between volume declines, costs, and financial performance is discussed in Chapter 3.

Table 2-3. Change in Costs Per Case and Case-Mix Adjusted Costs Per Case for Selected Hospital Groups, PPS 1 and PPS 6

	Unadjusted Costs Per Case			Case-mix Adjusted Costs Per Case		
Hospital Group	PPS 1	PPS 6	Percent Change	PPS 1	PPS 6	Percent Change
All hospitals	$2,547	$3,984	56%	$2,342	$3,188	40%
Urban	3,166	4,982	60	2,791	3,790	39
Rural	1,940	2,881	52	1,911	1,608	41
Sole community	2,082	3,001	53	2,053	2,789	43
Rural referral	2,328	3,740	61	2,136	2,940	40
Other rural	1,850	2,713	51	1,836	2,505	40
Rural <25 beds	1,839	2,627	53	1,831	2,613	47
Rural 25-49 beds	1,811	2,603	51	1,824	2,488	42
Rural 150-199 beds	2,141	3,362	58	2,019	2,813	41
Rural 200+ beds	2,347	3,836	63	2,148	2,998	42
Frontier	2,015	2,745	49	2,022	2,711	42
Non-frontier	1,929	2,897	53	1,897	2,595	40

Note: Data for each PPS year corresponds to each hospital's cost reporting period beginning in that year. For instance, the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6.

Data are weighted to the hospital level so that the figures reported represent the average hospital within each group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care financing Administration.

MODELING THE EFFECTS OF FISCAL YEAR 1991 POLICY IN PPS 1

The Senate Appropriations Committee asked the Commission to estimate the extent to which current policies would have helped rural hospitals if they had been in place at the beginning of PPS. To answer this question, the ProPAC PPS payment model was used to estimate the payments that would have been made to PPS hospitals if fiscal year 1991 policies had been in effect in PPS 1. In considering these estimates, it is important to note several qualifications.

First, some features of fiscal year 1991 policy cannot be replicated exactly in PPS 1. For example, the fiscal year 1991 area wage index is based on 1988 data that include fringe benefits and allocated home office costs as part of total hourly compensation. It would have been inappropriate to apply this index directly in place of the actual wage index in use in PPS 1, because the fiscal year 1991 index reflects the relative levels of hourly compensation that existed in 1988 rather than hourly compensation levels in fiscal year 1984 or an earlier year. Moreover, data on fringe benefits and home office costs were not collected in earlier HCFA wage surveys. Therefore, the Commission used a wage index based on the 1982 wage survey data, adjusted to reflect the relative impact of fringe benefits and home office costs in 1988. Other assumptions were also required to model fiscal year 1991 policy in PPS 1. A detailed description of the assumptions and limitations of this model is included in Appendix B.

In addition, there were broad differences in policy that existed between fiscal year 1991 and PPS 1. When PPS was enacted in 1983, Congress imposed two conditions on the implementation of the new system. To limit the immediate financial impact of prospective payment, the Secretary was required to implement PPS gradually over a three-year transition period. During this period, payments to hospitals were based on a changing blend of hospital-specific base year costs per case and national average PPS rates. Thus, in PPS 1, hospitals were paid on a blend of 75 percent of their hospital-specific base year costs per case and 25 percent of Federal regional payment rates. Second, Congress required the Secretary to set the PPS payment rates during the first two years of PPS so that aggregate payments to hospitals would be neither larger nor smaller than the aggregate payments hospitals would have received under the TEFRA reimbursement limits that PPS replaced. This requirement was known as budget neutrality.

These conditions no longer apply in the eighth year of PPS (fiscal year 1991). However, even if most, if not all, of the policy changes incorporated in fiscal year 1991 policy could have been applied in PPS 1, it is unlikely that the transition and budget neutrality provisions would have been discarded. Thus, the impact of fiscal year 1991 policy would have been limited in PPS 1 by these provisions, just as the impact of fiscal year 1984 policy was limited.

The Effects on Payments in PPS 1

To address these issues, payments were estimated using fiscal year 1991 policy on PPS 1 data under three different scenarios.

Fully Implemented--In this model, fiscal year 1991 policy was applied to 100 percent of payments. This assumes PPS policy was fully implemented in PPS 1, without a transition period or a budget neutrality requirement. Because fiscal year 1991 policy on average helps rural hospitals, applying fiscal year 1991 policy to 100 percent of hospital payments in PPS 1 dramatically overstates the likely improvement in payments to rural hospitals in PPS 1. In PPS 1, only 25 percent of hospital payments were determined by the PPS regional payment rates and budget neutrality was required. On the other hand, this model shows the full impact that fiscal year 1991 policy would have if budget neutrality were not imposed.

With Transition--In this model, fiscal year 1991 policy was applied to 25 percent of payments, while the remaining 75 percent of payments was based on the hospital-specific payment amounts that actually applied in PPS 1. This scenario is also not budget neutral; aggregate payments to all hospitals were allowed to increase above actual aggregate PPS payments in PPS 1. While the impact of fiscal year 1991 policy is limited by the transition mechanism, rural hospitals are permitted to benefit from changes in policy without reducing payments to urban hospitals.

Budget Neutral with Transition--This model incorporates both the transition and the budget neutrality requirements. Consequently, fiscal year 1991 policy was applied to 25 percent of payments, and total payments were held to what was actually paid in PPS 1. These payment estimates most closely approximate the likely effects of fiscal year 1991 policy in PPS 1.

The estimates from the first model show that payments to rural hospitals would have increased by almost 23 percent if fiscal year 1991 policy had been fully implemented in PPS 1 (see Table 2-4). Payments to sole community hospitals also would have been 23 percent higher, while payments to small rural hospitals would have increased about 33 percent. This model shows the maximum possible effect of 1991 policy on PPS 1 payments. Because budget neutrality is not assumed, payments to all hospitals would have increased by almost 8 percent.

If the transition were assumed without budget neutrality, rural hospitals would have received over 7 percent more in payments than was actually the case in PPS 1. Payments to sole community hospitals and small rural hospitals would have increased by 8 percent or more. However, payments to major teaching hospitals would have decreased by 2 percent.

Finally, assuming both the transition and budget neutrality, rural hospitals would have received 5.5 percent more in total PPS payments than they actually received in PPS 1. This number most accurately reflects how payments would have changed in PPS 1 if 1991 policy had been implemented, since the transition and budget neutrality were both in place in PPS 1. Small rural hospitals would have benefitted the most, with an increase in payments of 7.2 percent. Payments to sole community hospitals (including all hospitals designated as SCHs in 1991) would have increased more than 6 percent. Since budget neutrality is assumed, these increases would have been funded by a 1.1 percent reduction in payments to urban hospitals. Payments to major teaching hospitals would have decreased by 3.6 percent.

Table 2-4. Percent Change in Payments in PPS 1 Under Alternative Fiscal Year 1991 Payment Models

Hospital Group	Fully Implemented	With Transition	Budget Neutral With Transition
All hospitals	7.7%	1.6%	0.0%
Urban	4.7	0.5	-1.1
Rural	22.8	7.2	5.5
Rural referral	20.1	7.1	5.4
Sole community	23.4	8.0	6.3
Other rural	24.2	7.1	5.4
Major teaching	2.0	-2.0	-3.6
Other teaching	3.7	0.5	-1.1
Non-teaching	12.0	3.3	1.7
Disproportionate share:			
Large urban	2.4	0.7	-0.9
Other urban	9.6	0.7	-0.9
Rural	25.3	6.7	5.0
Non-disproportionate share	7.9	1.9	0.3
Urban <100 beds	9.3	1.8	0.2
Urban 100-199 beds	8.0	1.6	0.0
Urban 200-299 beds	6.0	1.0	-0.6
Urban 300-399 beds	3.8	0.6	-1.0
Urban 400-499 beds	4.6	0.3	-1.3
Urban 500+ beds	1.0	-1.1	-2.6
Rural <50 beds	33.4	8.9	7.2
Rural 50-99 beds	22.9	7.1	5.4
Rural 100-149 beds	20.1	7.0	5.4
Rural 150-199 beds	21.6	7.4	5.7
Rural 200+	16.8	6.0	4.3
Voluntary	5.6	1.2	-0.4
Proprietary	9.7	2.4	0.8
Urban government	11.8	0.7	-0.8
Rural government	26.3	7.7	6.0

Note: Percent difference from actual payments in PPS 1. Based on 4,475 hospitals that had data in the MedPAR file for fiscal year 1984 and Medicare Cost Report data for PPS 1; excludes hospitals in Maryland, Massachusetts, New Jersey, New York, and Puerto Rico.

SOURCE: ProPAC analysis of fiscal year 1984 MedPAR data.

Effects of Individual Policies

The first part of the analysis examined the joint effects of all fiscal year 1991 policies in PPS 1. However, the Senate Appropriations Committee also asked ProPAC to estimate the impact of individual policy changes, such as sole community hospital designation or alternative wage index methodologies. To do this, a fully-implemented model of fiscal year 1984 policy was estimated for PPS 1, changing only the policy of interest to fiscal year 1991 policy. The resulting payment estimates were then compared to estimates of payments from a fully-implemented model of fiscal year 1984 policy in PPS 1 without the change.

Both models were estimated without budget neutrality. The difference between the payment estimates from the two models, therefore, shows the maximum effect of each individual

policy, independent of the transition and budget neutrality requirements. This method, however, overstates the effect of each policy, since the transition and budget neutrality provisions applied in PPS 1. It should also be noted that individual policy effects are not additive, due to interactions among the different policies.

This analysis was carried out for the following policies (see Table 2-5):

Wage Index Changes--The HCFA wage survey data for 1982 were used to model fiscal year 1991 wage index policy in PPS 1, since it is the most recent wage data that could have been available for use in that year. As noted above, the fiscal year 1991 wage index is based on total hourly compensations, including home office costs and fringe benefits. To incorporate this feature of fiscal year 1991 policy, a wage index based on the 1982 data was adjusted as if the relationship between hourly total compensation and hourly wages and salaries was the same in 1982 as it was in the 1988 HCFA survey data.

The 1991 wage index methodology would have increased payments to hospitals overall by only 0.4 percent. The largest estimated impact on any rural hospital group was a 2 percent increase for small rural hospitals. Conversely, payments to larger rural hospitals would have declined. Generally, however, the main effects of this policy appear to be regional. For example, the Pacific region would have benefitted with a 6.8 percent increase in payments relative to fully implemented fiscal year 1984 policy in PPS 1. This may reflect strong regional patterns in the use of part-time and full-time labor or in the relative importance of fringe benefits and home office costs.

1991 Standardized Amounts, Deflated to PPS 1 Dollars--In fiscal year 1991 each hospital is paid according to one of three separate standardized amounts; one for hospitals located in large urban areas (MSAs with a population of over 1 million), one for hospitals located in other urban areas, and one for hospitals located in rural areas. In PPS 1 there were only 2 standardized amounts, one for urban and one for rural hospitals. To estimate the impact of changes in the standardized amounts, the fiscal year 1991 standardized amounts were deflated to PPS 1, using the average annual PPS updates during the period from PPS 1 to fiscal year 1991. It is important to note that the fiscal year 1991 standardized amounts incorporate a number of other policy changes beside the change from two to three standardized amounts. The most important among these are the shift from hospital- to discharge-weighting in the calculation of the standardized amounts, the shift to separate outlier financing pools for urban and rural hospitals, and the differential annual update factors applied to urban and rural hospitals since fiscal year 1988.

If the policies incorporated in the (deflated) fiscal year 1991 standardized amounts had been applied in PPS 1, rural hospitals would have benefitted significantly. Their payments would have increased 16.6 percent, while payments to other rural hospitals (excluding referral centers and sole community hospitals) would have increased 18.3 percent. Similar increases in payments also would have occurred for all bed size groups of rural hospitals.

Table 2-5. Percent Change in Payments Due to Individual Fiscal Year 1991 Policies in PPS 1

Hospital Group	Wage Index	Deflated Standardized Amounts	Facility Designations	Disproportionate Share Policy
All hospitals	0.4%	3.3%	1.0%	2.3%
Urban	0.5	0.8	0.0	2.6
Rural	0.1	16.6	6.3	0.6
Rural referral	-0.9	16.3	21.9	0.6
Sole community	0.4	10.9	-1.7	0.7
Other rural	0.5	18.3	0.1	0.5
Major teaching	0.4	1.1	0.2	5.0
Other teaching	0.1	1.2	0.5	2.2
Non-teaching	0.7	5.5	1.6	1.6
Disproportionate share:				
Large urban	1.8	1.3	0.0	7.1
Other urban	-1.2	0.1	-0.1	4.7
Rural	-2.8	16.1	6.8	3.2
Non-disproportionate share	0.7	4.4	1.4	0.0
Urban <100 beds	2.2	0.7	0.1	0.6
Urban 100-199 beds	1.1	0.9	0.0	3.6
Urban 200-299 beds	1.2	0.8	0.0	3.0
Urban 300-399 beds	0.7	0.8	0.0	2.7
Urban 400-499 beds	0.2	0.8	-0.1	2.5
Urban 500+ beds	-1.2	0.8	-0.1	
Rural <50 beds	2.0	16.6	-0.2	0.4
Rural 50-99 beds	0.1	16.7	1.0	0.4
Rural 100-149 beds	0.1	16.4	5.6	0.8
Rural 150-199 beds	-0.7	17.5	12.5	0.8
Rural 200+	-1.7	16.1	18.0	0.6
New England	2.3	2.6	1.2	0.6
Middle Atlantic	-2.5	2.2	0.7	1.5
South Atlantic	-2.8	3.9	1.2	2.6
East North Central	0.3	2.7	1.0	1.7
East South Central	-4.4	5.1	1.6	3.0
West North Central	4.1	5.7	1.4	1.1
West South Central	-1.9	4.5	1.2	2.7
Mountain	-0.3	2.9	0.8	0.9
Pacific	6.8	1.4	0.3	3.8
Voluntary	0.5	2.6	0.9	1.9
Proprietary	-0.4	4.6	1.1	2.3
Urban government	0.6	0.9	-0.2	5.5
Rural government	0.4	17.0	4.2	0.8

Note: Percent difference using individual fiscal year 1991 policy parameters on the fully implemented PPS 1 model. Based on 5,037 hospitals; excludes hospitals in Maryland, Massachusetts, New Jersey, New York, and Puerto Rico.

SOURCE: ProPAC analysis of fiscal year 1984 MedPAR data.

Rural Referral Centers, Sole Community Hospitals, Small Rural Medicare-Dependent Hospitals, and Redesignated Rural Hospitals--For this analysis, payments for hospitals designated as RRCs, SCHs, MDHs, and redesignated rural hospitals (RRHs) in fiscal year 1991 were calculated according to the applicable fiscal year 1991 payment policies in PPS 1.[9] In general, applying the current designations and related fiscal year 1991 payment policies to these hospitals would have increased payments to rural hospitals by 6.3 percent in PPS 1.

However, the impact would have been quite uneven among these special groups. For example, payments to rural referral centers would have increased 22 percent. This increase primarily reflects two major changes in payment policy for referral centers between fiscal year 1984 and fiscal year 1991. Under fiscal year 1984 policy, only the few referral centers that had 500 or more beds and were located in a rural area received special treatment; their payments were based on the urban standardized amount. The small number of hospitals that qualified for referral center status on the basis of other criteria did not receive special treatment. These hospitals were paid on the basis of the rural standardized amount. Over the course of the next five years, Congress repeatedly liberalized the criteria, and increased the number of qualifying hospitals from a mere handful to about 250. In addition, the Secretary decided to pay all referral centers on the basis of the urban standardized amount.[10] Therefore, applying fiscal year 1991 policy in PPS 1 results in a huge increase in the number of referral centers that receive the higher payments.

According to the model, payments to sole community hospitals would have declined if fiscal year 1991 policy had been in place in PPS 1. This result reflects the difficulty of modeling fiscal year 1991 payment policy for SCHs in PPS 1. Under fiscal year 1991 policy, SCHs are paid the greater of three amounts: payments based on their 1982 base year cost per case updated to the present; payments based on their 1987 base year costs per case updated to the present; or payments based on the Federal national rates. For several reasons, the true impact of this policy is substantially understated when it is modelled in PPS 1. First, hospitals' 1987 base year costs would not have existed in PPS 1. Therefore, payments to SCHs were modeled as if the choice was limited to the comparison between their 1982 base year costs and 100 percent of the Federal rates. Because this is very close to the choice SCHs actually had in PPS 1, the apparent effect of this policy is a small decline in payments (-1.7 percent).

A second problem is that all hospitals designated as SCHs in fiscal year 1991 were treated as SCHs for both fiscal year 1991 policy and for fiscal year 1984. However, hospitals have always had the option under PPS to apply for SCH designation, relinquish that designation and reapply at a later date. Many of the hospitals designated as SCHs in fiscal year 1991 did not choose to apply for the designation until Congress adopted the current set of payment options. This suggests that the earlier option (available from fiscal year 1984 to fiscal year 1990) of payment based on a blend of 25 percent Federal regional rates and 75 percent hospital-specific 1982 base year costs was not financially attractive to many of the hospitals that could

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[9] The impact these policies would have had in PPS 1 on hospitals with MDH or RRH designation was not examined separately.

[10] Beginning in FY 1988, referral centers have been paid on the basis of the standardized amount for hospitals located in an other urban area.

qualify for SCH status. Thus, it is not surprising that payments to all current SCHs declined, because many of them were paid by the model according to a payment option very similar to one they had rejected earlier.

Disproportionate Share Adjustment--As noted earlier, DSHs receive additional payments under PPS. Since this policy did not exist in PPS 1, applying fiscal year 1991 DSH policy in PPS 1 would have led to increased payments for DSHs. However, the DSH policy was designed primarily to help large urban inner city hospitals that serve large numbers of poor patients. Thus, the largest increases in payments under fiscal year 1991 policy in PPS 1 would have gone to DSHs located in large urban areas (7.1 percent), urban government-owned hospitals (5.5 percent) and major teaching hospitals (5.0 percent).[11] Nonetheless, although rural hospital payments overall would have been only 0.6 percent higher, payments to rural disproportionate share hospitals would have increased by 3.2 percent.

Effects on Hospital Financial Performance in PPS 1

ProPAC also examined the combined impact of these policy changes on hospital financial performance in PPS 1. Current policy would have improved the overall financial performance of rural hospitals if it had been implemented in PPS 1. Assuming that the transition and budget neutrality provisions would have applied (see Table 2-6, column 5), the median PPS margin for rural hospitals would have been almost equal to the median for urban hospitals (13.4 percent versus 14.2 percent for urban hospitals) under fiscal year 1991 policy. The actual median margin for rural hospitals in PPS 1 was 8.2 percent, compared with 14.6 percent for urban hospitals (see Table 2-6, column 2). The median PPS margin for small rural hospitals would have more than doubled if 1991 policy had been in effect, increasing from an actual value of 6.7 percent to an estimated 13.4 percent. The median margin for major teaching hospitals, on the other hand, would have decreased slightly.

While PPS margins provide a measure of how well hospitals are paid by Medicare relative to their Medicare-allowed inpatient operating costs, they do not measure how well hospitals are performing overall, including all sources of payment. A better measure of overall financial performance is the total margin, which measures how well a hospital is paid from all sources of payment relative to its total costs. A hospital with a negative PPS margin may be able to subsidize its losses from other sources of payment; a hospital with a negative total margin cannot survive for any extended period of time.

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[11] Note that when the DSH policy was adopted in FY 1986, additional payments to DSH hospitals were accompanied by a substantial reduction in the teaching adjustment. Thus, the impact of FY 1991 DSH policy in PPS 1 would be offset to some degree for major teaching hospitals if the two policies were considered jointly.

Table 2-6. Comparison of Actual PPS 1 Median Margins with Estimated Median PPS Margins in PPS 1 Under Fiscal Year 1991 Payment Policy

Hospital Group	Number of Hospitals	Actual PPS 1	Fiscal Year 1991 Policy		
			Fully Implemented	With Transition	With Transition, Budget Neutral
All hospitals	4,475	11.6%	24.3%	15.2%	13.9%
Urban	2,214	14.6	20.8	15.3	14.2
Rural	2,261	8.2	27.1	14.7	13.4
Rural referral	219	9.2	25.1	15.2	13.9
Sole community	474	8.1	26.4	15.2	13.8
Other rural	1,568	8.0	28.0	14.3	13.0
Major teaching	144	18.6	22.8	17.3	16.0
Other teaching	740	15.3	19.7	15.8	14.5
Non-teaching	3,591	10.5	25.5	14.9	13.5
Disproportionate share:					
Large urban	404	15.9	19.5	17.3	16.0
Other urban	510	14.5	23.8	15.5	14.1
Rural	294	9.0	29.5	15.4	14.1
Non-disproportionate share	3,267	10.7	24.5	14.8	13.5
Urban <100 beds	543	12.7	24.1	14.8	13.4
Urban 100-199 beds	581	14.3	21.8	15.8	14.5
Urban 200-299 beds	462	14.8	19.8	15.5	14.2
Urban 300-399 beds	287	15.6	18.8	16.0	14.7
Urban 400-499 beds	173	15.4	19.8	15.5	14.1
Urban 500+ beds	168	16.9	19.5	16.6	15.3
Rural <50 beds	1,056	6.7	31.2	14.8	13.4
Rural 50-99 beds	701	9.0	26.3	14.8	13.5
Rural 100-149 beds	280	8.5	22.6	14.3	13.0
Rural 150-199 beds	115	7.9	24.9	14.8	13.4
Rural 200+	109	9.0	21.7	15.1	13.7
Voluntary	2,421	12.4	22.9	15.3	13.9
Proprietary	854	11.9	23.8	15.6	14.2
Urban government	342	13.9	26.3	15.5	14.2
Rural government	833	7.2	27.6	14.2	12.8

SOURCE: ProPAC analysis of fiscal years 1984 and 1989 MedPAR data and Medicare Cost Report data for PPS 1; excludes hospitals in Maryland, Massachusetts, New Jersey, New York, and Puerto Rico.

Under actual fiscal year 1984 policy, the median total margin of urban hospitals was 3 percentage points higher than the median for rural hospitals in PPS 1 (see Table 2-7). When fiscal year 1991 policy is applied to PPS 1 (assuming the transition and budget neutrality), however, the difference between the median total margins of urban and rural hospitals is reduced to one percentage point. This narrowing occurs because the median total margin for rural hospitals would have increased substantially (from 4.0 percent to 6.0 percent) while the median total margin for urban hospitals would be essentially unchanged (from 7.1 percent to 7.0 percent). The median total margins of small rural, sole community, and other rural hospitals would have increased substantially, from 2.8 percent under actual fiscal year 1984 policy to 5.5 percent under fiscal year 1991 policy, as would the medians for sole community hospitals and other rural hospitals. In short, total margins in PPS 1 are affected by fiscal year 1991 policy in much the same way as PPS margins.

Table 2-7. Comparison of Actual Median Total Margins in PPS 1 with Estimated Median Total Margins in PPS 1 Under Alternative Fiscal Year 1991 Payment Models

Hospital Group	Number of Hospitals	Actual PPS 1	Fiscal Year 1991 Policy		
			Fully Implemented	With Transition	With Transition, Budget Neutral
All hospitals	4,146	5.7	10.9	7.0	6.5
Urban	2,031	7.1	9.8	7.4	7.0
Rural	2,115	4.0	12.3	6.5	6.0
Large urban core	802	7.4	8.0	7.6	7.2
Large urban ring	154	6.3	12.0	7.2	6.7
Other urban	1,075	7.0	10.6	7.4	7.0
Rural referral	211	6.4	12.4	8.9	8.4
Sole community	442	3.8	11.3	6.6	6.1
Other rural	1,462	3.7	12.6	6.2	5.6
Major teaching	112	5.1	5.2	4.8	4.5
Other teaching	680	7.2	8.7	7.3	6.9
Non-teaching	3,354	5.3	11.6	7.0	6.5
Disproportionate share:					
Large urban	360	6.1	6.4	6.3	5.8
Other urban	476	6.8	10.6	7.4	6.8
Rural	273	3.7	11.8	6.1	5.5
Non-disproportionate share	3,037	5.7	11.3	7.1	6.6
Urban <100 beds	497	4.8	9.7	5.2	4.7
Urban 100-199 beds	537	7.0	9.7	7.6	7.1
Urban 200-299 beds	423	7.8	9.8	8.2	7.7
Urban 300-399 beds	268	7.8	9.4	8.0	7.6
Urban 400-499 beds	159	8.9	10.5	8.6	8.1
Urban 500+ beds	147	8.5	9.6	8.2	7.8
Rural <50 beds	970	2.8	13.6	6.0	5.5
Rural 50-99 beds	661	4.4	11.7	6.5	6.0
Rural 100-149 beds	268	4.8	11.0	6.6	6.1
Rural 150-199 beds	111	5.8	10.8	7.8	7.3
Rural 200+	105	7.0	11.4	8.9	8.4
Voluntary	2,277	6.1	10.3	7.2	6.7
Proprietary	763	5.8	11.3	7.4	7.0
Urban government	302	6.1	11.0	6.4	6.0
Rural government	782	3.8	12.8	6.4	5.9

SOURCE: ProPAC analysis of fiscal year 1984 MedPAR data and Medicare Cost Report data for PPS 1; excludes hospitals in Maryland, Massachusetts, New Jersey, New York, and Puerto Rico, and those missing total cost data.

MODELING THE EFFECTS OF FISCAL YEAR 1991 POLICY IN PPS 6

While imposing fiscal year 1991 policy in PPS 1 under budget neutrality would have redistributed payments from urban to rural hospitals, it is important to remember that average PPS margins in PPS 1 were well above zero, and that margins overall have been declining steadily since PPS 1. This general decline in financial performance is attributable to both the changes in the demand for hospital inpatient care and the effects of changes in payment policies. PPS margins have declined, in part, due to the differential effects of decreases in the volume of discharges on payments per case and operating costs per case. Moreover, the changes in volume and case mix that affect hospitals' PPS payments and costs had different effects on rural and

urban hospitals. Further, much of the general decline in PPS margins reflects the fact that the annual PPS updates have not kept up with the rate of increase in hospitals' Medicare operating costs per case.

To better understand the current impact of these changes, the Commission examined the effect of fiscal year 1991 policy in PPS 6, the most recent year for which actual hospital cost data are available. Except for the average annual updates for fiscal year 1985 through fiscal year 1989, fiscal year 1991 policy is held essentially constant between the estimates for PPS 6 and those for PPS 1. Therefore, differences in payments and margins between the two sets of estimates are attributable to the cumulative update (about 11.4 percent) and the effects of other factors that are not directly related to PPS policy, such as changes in Medicare discharge volume and case mix over time. Comparisons between these estimates permit an assessment of the likely current impact of cumulative changes in PPS policy. They also may permit a limited evaluation of the relative roles of policy changes and changes in hospital circumstances, such as volume declines, in influencing hospital financial performance over time.

Effects on Financial Performance in PPS 6

Estimates show that if fiscal year 1991 policy had been in effect in PPS 6, the typical rural hospital would have had a higher PPS margin than the typical urban hospital (see Table 2-8). Yet even with the substantial help offered by fiscal year 1991 policy, the median margin for all rural hospitals would have been negative (-0.5 percent), well below the high median margin (13.4 percent) that would have occurred if fiscal year 1991 policy had been in place in PPS 1.

While the financial performance of rural hospitals would have improved in PPS 6 under fiscal year 1991 policy (relative to actual fiscal year 1989 policy), the improvement would not have been uniform among subgroups of rural hospitals. For example, the median PPS margin for small rural hospitals would have improved from the actual median PPS 6 margin of -2.1 percent to an estimated median margin of 1.4 percent under 1991 policy. SCHs would have been helped even more by fiscal year 1991 policy, going from an actual median PPS 6 margin of -5.8 percent to an estimated median of 1.3 percent. Note, however, that the only hospital groups that have positive estimated median PPS margins under fiscal year 1991 policy are groups that have been targeted by specific changes in PPS payment policy -- SCHs, small rural hospitals, DSHs, major teaching hospitals, and urban government hospitals. Thus, fiscal year 1991 policy would have helped many rural and urban hospitals in PPS 6 relative to their actual performance under the fiscal year 1989 policies in effect at the time. However, improvements in performance appear to be relatively concentrated in specific groups of hospitals targeted by explicit policy changes.

Table 2-8. Comparison of Actual 1989 PPS Margins with Estimated Median PPS Margins in PPS 6 Under Fiscal Year 1991 Payment Policy

	Actual FY 1989	FY 1991 Policy
All hospitals	-3.2	-2.1
Urban	-2.9	-3.4
Rural	-3.5	-0.5
Rural referral	-2.8	-2.6
Sole community	-5.8	1.3
Other rural	-2.9	-0.8
Major teaching	7.0	9.4
Other teaching	-1.6	-2.3
Non-teaching	-4.1	-2.4
Disproportionate share:		
Large urban	0.4	3.2
Other urban	0.5	1.4
Rural	1.1	6.7
Non-disproportionate share	-4.4	-3.8
Urban <100 beds	-2.8	-6.3
100-199 beds	-4.3	-3.9
200-299 beds	-3.1	-3.2
300-399 beds	-2.8	-2.6
400-499 beds	-0.6	-1.1
500+ beds	-0.5	0.1
Rural <50 beds	-2.1	1.4
50-99 beds	-3.9	-1.0
100-149 beds	-4.7	-3.0
150-200 beds	-4.1	-0.7
200+ beds	-5.2	-4.7
Voluntary	-2.3	-2.2
Proprietary	-6.5	-4.4
Urban government	1.3	2.3
Rural government	-4.6	-0.4

Note: Estimates are budget neutral to actual 1989 payments.

SOURCE: ProPAC analysis of PPS 6 MedPAR data for fiscal year 1989 and Medicare Cost Report data for PPS 6. Based on 4,510 hospitals; excludes hospitals in Maryland, Puerto Rico, and the Finger Lakes Demonstration Project (New York), as well as those with missing data.

Estimated total margins under fiscal year 1991 policy in PPS 6 show similar patterns (see Table 2-9). Median total margins for urban and rural hospitals would have been essentially equalized (4.0 percent versus 3.7 percent), compared to a difference in actual median total margins of 1.4 percentage points. Again, the largest improvements in PPS 6 median total margins under fiscal year 1991 policy compared to actual median total margins appear to be concentrated in targeted groups of hospitals. For example, the median total margin for SCHs would have increased from 2.1 percent to 4.5 percent under 1991 policy.

Table 2-9. Comparison of Actual 1989 Median Total Margins and Estimated Median Total Margins in PPS 6 Under Fiscal Year 1991 Payment Policy

Hospital Group	Number of Hospitals	Actual FY 1989	FY 1991 Policy
All hospitals	3,819	3.4%	3.8%
Urban	1,808	4.0	4.0
Rural	2,011	2.6	3.7
Large urban core	679	3.3	3.3
Large urban ring	145	4.1	3.5
Other urban	984	4.3	4.5
Rural referral	214	5.5	6.0
Sole community	408	2.1	4.5
Other rural	1,389	2.1	2.9
Major teaching	91	2.8	3.1
Other teaching	624	4.3	4.5
Non-teaching	3,104	3.1	3.7
Disproportionate share:			
Large urban	285	1.8	2.5
Other urban	425	4.5	5.0
Rural	263	2.5	3.7
Non-disproportionate share	2,846	3.4	3.8
Urban <100 beds	418	2.0	1.8
Urban 100-199 beds	466	3.4	3.3
Urban 200-299 beds	386	4.2	4.4
Urban 300-399 beds	252	5.2	5.1
Urban 400-499 beds	145	5.0	5.1
Urban 500+ beds	141	6.1	6.4
Rural <50 beds	883	1.3	2.3
Rural 50-99 beds	651	2.4	3.5
Rural 100-149 beds	258	3.8	4.7
Rural 150-199 beds	110	4.8	5.4
Rural 200+	109	5.3	5.4
Voluntary	2,135	3.8	4.1
Proprietary	714	2.6	3.1
Urban government	251	4.1	4.1
Rural government	700	2.2	3.5

SOURCE: ProPAC analysis of fiscal year 1989 MedPAR data and Medicare Cost Report data in PPS 6. Excludes hospitals in Maryland, Puerto Rico, and the Finger Lakes Demonstration Project (New York), as well as hospitals missing total cost data.

Winners and Losers Under 1991 Policy

While current policy would have helped rural hospitals considerably, there is a wide distribution of financial performance among rural hospitals (and all other hospital groups, as well). Even with the more generous fiscal year 1991 policy, some rural hospitals would have performed poorly under PPS, while others would have had high margins. To understand the

range of impact of fiscal year 1991 policy, the Commission examined the distribution of hospital PPS margins within each hospital group under fiscal year 1991 policy in PPS 6. In general, fiscal year 1991 policy would have shifted the whole distribution of PPS margins up or down somewhat within each hospital group, as indicated by the change in the median PPS margin for each group. However, the effects of fiscal year 1991 policy also would have been highly variable among the individual hospitals within each group. That is, some hospitals would have experienced large increases in their PPS margin, while other hospitals in the same group would have experienced a decline in their PPS margin. On balance, however, fiscal year 1991 policy would not have narrowed the distribution of PPS margins to a significant degree in any hospital group.

Changes in Other Factors that Affect PPS Payments

As noted above, the changes in hospital financial performance that would have occurred between PPS 1 and PPS 6 if fiscal year 1991 policy had been in effect throughout the period are attributable to two sets of factors. One source of changes in performance is the cumulative PPS update during the period from fiscal year 1985 through fiscal year 1989. A second source of changes in margins is the impact of factors that are not directly related to PPS policy, such as changes in the volume of Medicare discharges and changes in hospitals' CMIs.

Changes in volume and case mix affect PPS margins through their impact on PPS payments and through their impact on PPS operating costs. Although it is difficult to disentangle the effects of these factors on operating costs, it is possible to estimate their impact on PPS payments. To do this, the Commission estimated the percentage change in PPS payments for each hospital between the fully implemented models of fiscal year 1991 policy in PPS 1 and PPS 6. Since the cumulative average update for the intervening years was the same for all hospitals (about 11.4 percent), this factor was excluded from the change in PPS payments. The remainder of the percentage change in PPS payments, therefore, represents primarily the effects of changes in the volume of Medicare discharges and changes in hospitals' CMIs between PPS 1 and PPS 6. Because the percentage change in Medicare discharges and the percentage change in the CMI are known for each hospital, the effects of these factors could be separately measured. The small residual that remains reflects a variety of small effects, such as changes in relative wage levels between the 1982 wage index and the 1988 wage index.

The resulting estimates show that the effects of volume declines and changes in case mix on PPS payments were very different for different groups of hospitals. All other factors combined would have increased total payments to all hospitals by 4.2 percent (see Table 2-10). This increase in payments is primarily due to the 17 percent increase in CMI between PPS 1 and PPS 6. However, decreases in volume would have reduced total payments by 9.2 percent.

Changes in these factors would have reduced total payments to rural hospitals by 10.8 percent between PPS 1 and PPS 6. While changes in CMI increased rural payments by 12 percent, the huge volume decreases that occurred during this time period decreased rural payments by almost 16 percent. Other factors reduce payments to rural hospitals by an additional 5.7 percent. The decline in volume most dramatically affected rural hospitals with less than 50 beds, resulting in a 28 percent decrease in payments.

Table 2-10. Percent Change in Payments Between PPS 1 and PPS 6, Due to Other Factors

Hospital Group	Number of Hospitals	Total	Volume	CMI	CMI and Other	Other
All hospitals	4,769	4.2%	-9.2%	17.0%	14.7%	-2.0
Urban	2,369	7.6	-7.0	18.1	15.6	-2.1
Rural	2,400	-10.8	-15.6	12.1	5.7	-5.7
Rural referral	232	5.4	-4.8	15.6	10.7	-4.3
Sole community	497	-12.0	-17.0	10.2	6.0	-3.9
Other rural	1,671	-19.7	-20.3	9.8	0.8	-8.2
Major teaching	162	16.4	-3.0	18.3	20.0	1.4
Other teaching	785	7.9	-6.5	18.3	15.4	-2.4
Non-teaching	3,822	-1.2	-11.4	15.7	11.6	-3.5
Disproportionate share:						
Large urban	455	7.2	-9.6	17.6	18.6	0.9
Other urban	533	13.6	-4.8	18.6	19.4	0.7
Rural	327	-6.1	-13.3	12.3	8.3	-3.6
Non-disproportionate share	3,454	0.7	-10.1	16.6	12.0	-3.9
Urban < 100 beds	585	-14.3	-19.9	13.9	6.9	-6.2
Urban 100-199 beds	629	2.6	-8.6	16.0	12.2	-3.3
Urban 200-299 beds	486	6.9	-5.9	17.5	13.6	-3.3
Urban 300-399 beds	307	7.0	-7.8	18.4	16.1	-1.9
Urban 400-499 beds	182	12.3	-4.4	18.9	17.5	-1.2
Urban 500+ beds	180	15.6	-2.6	19.5	18.7	-0.7
Rural < 50 beds	1,131	-29.6	-28.0	6.9	-2.2	-8.5
Rural 50-99 beds	737	-17.3	-19.2	9.9	2.3	-6.9
Rural 100-149 beds	294	-4.9	-10.4	13.4	6.1	-6.4
Rural 150-199 beds	121	-5.7	-10.9	12.6	5.8	-6.0
Rural 200+	117	9.0	-3.1	15.9	12.5	-2.9
Voluntary	2,560	4.8	-8.0	16.8	13.9	-2.4
Proprietary	957	3.2	-11.4	19.9	16.5	-2.8
Urban government	358	11.7	-5.7	17.5	18.4	0.8
Rural government	864	-16.4	-19.7	10.7	4.1	-6.0

Note: All estimates are dollar weighted.

SOURCE: ProPAC analysis of the fiscal years 1984 and 1989 MedPAR data for hospitals that had data in both years; excludes hospitals in Maryland, Massachusetts, New Jersey, New York, and Puerto Rico.

Although changes in payment policy appear to have helped rural hospitals substantially, some of the benefits of policy change have been offset by changes in hospital circumstances. In particular, rural hospitals (other than referral centers) benefitted much less than urban hospitals from increases in case mix. At the same time, they were much more strongly adversely affected by the enormous declines in discharge volume the occurred over this time period.

ELIMINATING THE URBAN/RURAL DIFFERENTIAL IN STANDARDIZED PAYMENT AMOUNTS

As mentioned above, OBRA 1990 requires that the differential between the standardized payment amounts for other urban and rural hospitals be phased out by fiscal year 1995 through higher annual updates for rural hospitals. This policy will increase payments to rural hospitals still further relative to current policy. Moreover, because rural hospitals continue to have lower

average costs than urban hospitals, this policy will further enhance the relative financial performance of rural hospitals compared to urban hospitals.

To assess the likely impact of this policy, the Commission estimated what hospitals' PPS margins would have been in PPS 6 under fiscal year 1991 policy with and without elimination of the differential in the standardized amounts.[12] It is evident that eliminating the differential would have substantially improved PPS margins for most rural hospitals compared to current (fiscal year 1991) policy (see Table 2-11). The median PPS margin for all rural hospitals would have increased dramatically, from -0.5 percent to 4.2 percent. Conversely, the median PPS margin for all urban hospitals would have decreased from -3.4 percent to -4.1 percent.

However, the impact of this policy would not be uniform among rural hospitals. For example, because rural referral centers are paid based on the other urban standardized amount, they would not benefit from the elimination of the differential. To the extent that annual updates for urban hospitals are reduced slightly to finance higher updates for rural hospitals, referral centers would actually lose payments. In fact, the estimates (under the assumption of budget neutrality) suggest that the median PPS margin for referral centers would have declined by about three-quarters of a percentage point.

Earlier estimates showed that fiscal year 1991 policy would have substantially improved the PPS margins for many rural hospitals, but it would not have helped enough to raise the median margin above zero. If the differential also had been eliminated, however, the median PPS margin would have been above zero for each subgroup of rural hospitals, except for referral hospitals and rural hospitals with 200 or more beds. Margins for all urban hospitals would have declined.

[12] Estimated PPS margins in this section are based on payment estimates that were held budget neutral to actual payments in PPS 6. Although budget neutrality is not required by statute, if Congress sets the overall average update to reach a pre-determined budget target, setting differential updates for rural hospitals to eliminate the differential by FY 1995 would be very similar to imposing budget neutrality.

Table 2-11. Estimated Median PPS Margins in PPS 6 Under Fiscal Year 1991 Payment Policy, With and Without Differential

Hospital Group	With Differential	Without Differential
All hospitals	-2.1%	-0.1%
Urban	-3.4	-4.1
Rural	-0.5	4.2
Rural referral	-2.6	-3.3
Sole community	1.3	5.3
Other rural	-0.8	5.5
Major teaching	9.4	8.8
Other teaching	-2.3	-2.7
Non-teaching	-2.4	0.1
Disproportionate share:		
Large urban	3.2	2.6
Other urban	1.4	0.7
Rural	6.7	11.0
Non-disproportionate share	-3.8	-1.4
Urban <100 beds	-6.3	-7.0
100-199 beds	-3.9	-4.7
200-299 beds	-3.2	-3.9
300-399 beds	-2.6	-3.3
400-499 beds	-1.1	-1.8
500+ beds	0.1	-0.6
Rural <50 beds	1.4	6.7
50-99 beds	-1.0	4.5
100-149 beds	-3.0	1.9
150-200 beds	-0.7	0.6
200+ beds	-4.7	-4.6
Voluntary	-2.2	-0.7
Proprietary	-4.4	-2.6
Urban government	2.3	1.6
Rural government	-0.4	4.0

Note: Estimates are budget neutral to actual 1989 payments.

SOURCE: ProPAC analysis of PPS 6 MedPAR data for fiscal year 1989 and Medicare Cost Report data for PPS 6. Based on 4,510 hospitals; excludes hospitals in Maryland, Puerto Rico, and the Finger Lakes Demonstration Project (New York), as well as those with missing data.

IMPLICATIONS FOR FUTURE POLICY CHANGES

In sum, the cumulative changes in PPS policies appear to have significantly improved the financial condition of rural hospitals, especially those targeted by the provisions in OBRA 1989 for sole community hospitals and small rural Medicare-dependent hospitals. The elimination of the differential in the rural and other urban standardized amounts will increase payments to rural hospitals even more. However, these benefits may be offset to some degree if the volume of discharges continues to decline in rural hospitals.

The policies enacted by Congress appear to have had their desired impact on improving the PPS performance of rural hospitals. Based on these analyses, the Commission does not recommend any further across-the-board adjustments to payments for rural hospitals. However, the distribution of performance continues to be very wide. Therefore, in addition to helping certain hospital groups, current policies appear to have helped and hurt individual hospitals within each group. Further analysis would be needed to identify these hospitals and to determine if access to care has been jeopardized by the impact of current payment policies. Targeted programs may be needed to direct additional payments to those hospitals required to ensure beneficiary access to care. A more complete discussion of this issue is presented in Chapter 4.

Chapter 3

Design Features of PPS that Disadvantage Rural Hospitals

When PPS was implemented, there was considerable concern that many small, mostly rural, hospitals would be penalized under a national, per case payment system. The prospective payment system was intended to establish rates adequate to cover the costs of efficient care. Yet over time questions have arisen about the fairness of these rates. In addition, the large decline in admissions experienced by many rural hospitals would, given the system's design, result in systematic underpayment.

This chapter begins with a discussion of the design features of PPS that may create problems for rural hospitals. Many of these problems result not from these hospitals being located in rural areas, but from low or fluctuating volume. Other problems reflect what may be incorrect adjustments in the payment system affecting all hospitals.

The most basic volume question centers on the minimum number of cases required by a hospital to obtain sufficient benefit from the averaging between cases implicit under PPS. Small hospitals may simply not treat enough cases to attain reasonable stability in their average costs per discharge. As a result, these hospitals may face greater financial risk than other hospitals under Medicare's fixed rate payment system.

Several analyses of the problems faced by hospitals with low or fluctuating volume are described. A detailed analysis of the relationship between volume and performance indicates patterns of volume change that are detrimental to hospital financial performance. Then, the effects of low volume and changes in volume on average costs per case are assessed. Both analyses suggest problems with and potential reforms of current payment policies.

A discussion of the use of nationally based diagnosis related group (DRG) weights follows. Rural hospitals may be disadvantaged because the weights are based on all cases, which are dominated by urban cases. However, rural hospitals have different cost structures. Differences in intensity and practice patterns, among other factors, will affect the relative importance of different cost components in rural hospitals. Also, because weights are based on national costs and distribution of cases, they may be inappropriate for those DRGs that occur more frequently at rural hospitals. Separate rural- and urban-based weights are estimated and the payments compared to payments derived using the current national weights.

The possible bias in the payment system due to the definition of outliers is discussed next. Although too complex to examine in the timeframe of this report, the issues surrounding separate urban and rural definitions of outlier cases are presented.

Finally, two problems affecting all hospitals are discussed: the use of a fixed labor share (the portion of the standardized amount that is wage adjusted) across all DRGs and all hospitals, and the labor market definitions. While these problems are beyond the scope of this report, they are raised here to be complete and to indicate the related analytic agenda of the Commission.

THE BASIC DESIGN OF PPS

Medicare's PPS attempts to create financial incentives to control inpatient costs by establishing a prospective payment rate per discharge for each type of case or diagnosis related group (DRG). The payment for each DRG is intended to cover the average operating cost per case incurred by an efficiently operated hospital in treating that type of patient. Hospitals are placed at risk for differences between their average cost of care and the payment rate they receive, creating opportunities for both profits and losses. This risk provides strong incentives to control the cost of care.

Under PPS, the basic DRG payment a hospital receives for a Medicare discharge is determined by three factors; the hospital's standardized payment amount, the wage index for the area in which the hospital is located, and the relative weight of the DRG to which the case is assigned. The hospital's standardized payment amount depends on whether the hospital is located in a large urban, other urban, or a rural area. The standardized amount, adjusted by the hospital's wage index, is the hospital's base payment amount per case. The hospital's basic DRG payment for each case is determined by multiplying the DRG weight for the case by the hospital's base payment amount.

To ensure that PPS payments would compensate hospitals fairly for appropriate differences in the cost of treating Medicare patients, Congress included a series of adjustments in the payment system. As noted above, payment rates are adjusted to account for differences in costs that are due to factors beyond a hospital's control, such as differences in the level of hospital input prices across geographic areas. They also are adjusted to allow for the impact on costs per case of activities that are considered socially desirable, such as operating approved graduate medical education programs or providing inpatient care to a disproportionate share of low-income persons.

SUFFICIENT NUMBER OF CASES REQUIRED FOR AVERAGING IMPLICIT UNDER PPS

The cost of care varies markedly among different types of cases (DRGs) and also among individual cases within each DRG. Since each hospital's PPS payment rates are fixed for all DRGs, all hospitals will experience losses and gains on individual cases within each DRG. PPS assumes implicitly that each hospital will have enough cases so that if it produces inpatient care at a cost consistent with the level of payments, then the gains and losses will tend to balance out within most DRGs, and especially across all DRGs. This balancing occurs as the costs of care are averaged over all cases within and across DRGs, and the gains and losses on individual cases tend to offset each other.

Other things equal, the gains and losses experienced by a hospital are much more likely to balance out if the hospital has a large number of cases.[1] Conversely, gains and losses are

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[1] A fundamental proposition of statistics, called the law of large numbers, states that the variability of the average of a set of cases will decrease as the number of cases increases.

much less likely to balance out in a hospital with relatively few cases. This is because higher volume offers a greater opportunity for offsetting gains against losses when compared with lower volume. Therefore, the average net gain or loss is likely to vary less for a hospital with many cases than for a low-volume hospital. Similarly, the selection of cases, within and among DRGs, is likely to vary much less from year to year in a high volume hospital than in a low volume hospital. Consequently, the average cost per case and average net gain or loss in a high volume hospital are likely to be less volatile from year to year.

This does not necessarily mean that hospitals with low volumes of cases will be more likely to lose money under PPS. Instead, low volume hospitals are more likely to face financial outcomes that are more volatile--for example, a large average loss per case in one year followed by a large average gain per case in the next year. However, exceptionally low margins, even in the short run, can put hospitals at extreme risk of closure. As a result, even if they could operate with equal efficiency, hospitals with a low volume of cases face greater financial risk under PPS than hospitals with large volumes of cases.

The total volume of discharges and the volume of Medicare discharges have declined precipitously since the beginning of PPS for many small hospitals. Therefore, the number of hospitals facing high levels of financial risk may have increased substantially during this period. The Commission is concerned about this possibility and will pursue analyses designed to measure differences in the extent of financial risk related to volume differences during its next analytic cycle.

RELATIONSHIP BETWEEN CHANGES IN VOLUME AND FINANCIAL PERFORMANCE

Small hospitals may be more financially vulnerable to volume changes than other hospitals for several reasons. A fixed payment per case implies that costs change proportionally to any change in volume. Under this assumption, payments would remain approximately equal to costs, regardless of the volume decline. Hospital managers are expected to adjust employment and the use of other resources quickly and completely in response to changes in volume.

However, some portion of hospital operating costs are fixed and cannot be altered in the short run. In response to increased volume, a hospital can not, for example, easily change to a medical records system with larger capacity. Because many hospital costs are fixed, volume declines have a significant impact on the hospital's average costs.[2] Other costs are considered variable and can be increased or decreased to match hospital use. For example, in response to increased admissions, a hospital can hire more nurses or put more beds into active service. Likewise, when admissions fall, a hospital can reduce its variable costs but not its fixed costs.

Under PPS, per case payments are based on average costs, consisting of both variable and fixed costs. When Medicare patient volume goes up or down, payments respond in a

[2] The theoretical relationship between inpatient volume and hospital costs is discussed in Appendix C.

directly proportional way. Due to the presence of fixed costs, however, an increase in Medicare patients leads to a smaller increase in costs, since only variable costs increase. Conversely, decreases in volume result in directly proportional decreases in payment, yet smaller decreases in costs since the fixed costs get spread over fewer cases, raising the average costs per case.

This method of calculating payment rates reflects the objective of PPS to target payments to hospitals that are able to maintain volume and thereby operate more efficiently. However, it implies that payments derived using base year volume and cost relationships may not reflect current volume and cost patterns, and may be inadequate to cover the actual costs per case. Moreover, once hospitals have lost sufficient volume, they begin to suffer from the first problem of not having a sufficient number of cases for their payments to equal their long-run average cost experience, exposing them to greater financial risk than other hospitals.

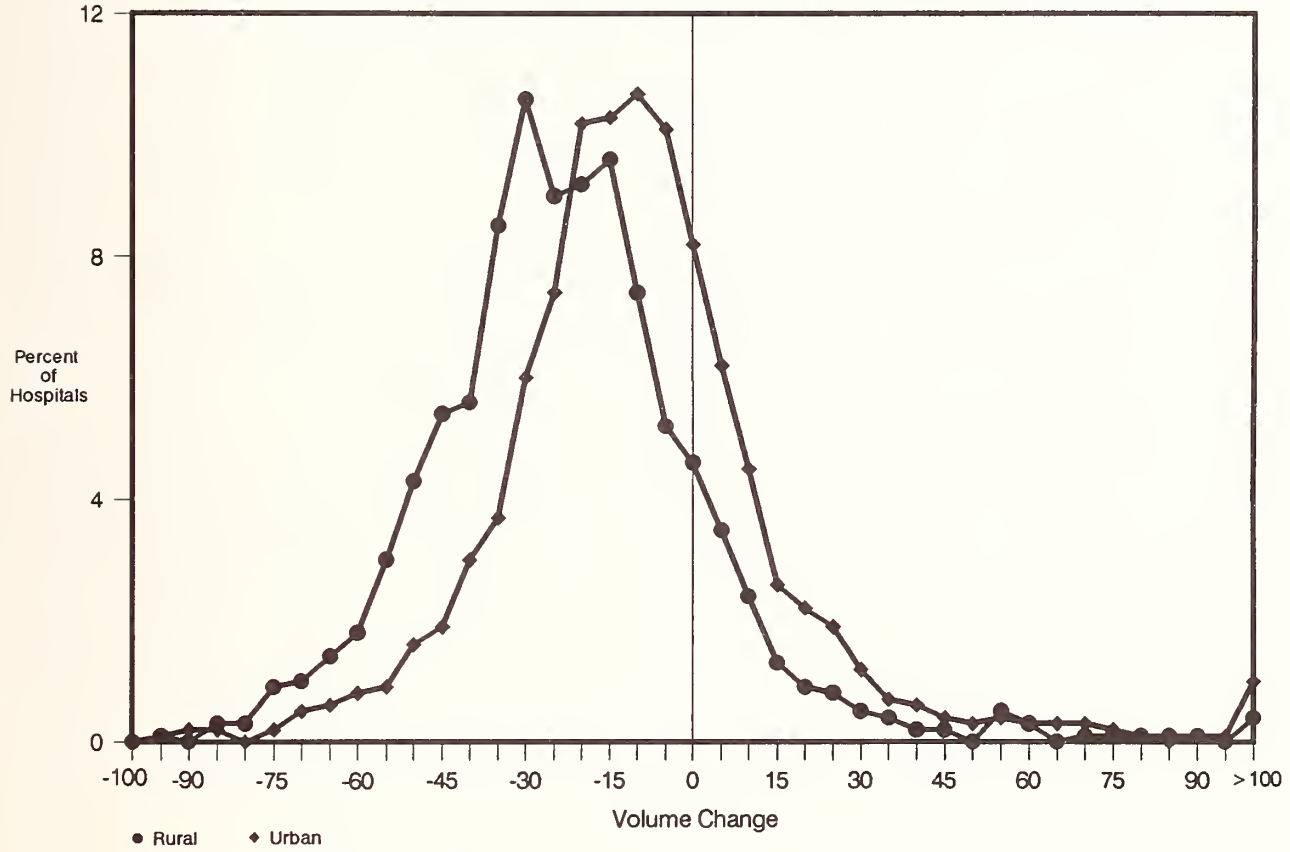
Rural hospitals are also more susceptible to variations in their volume. Hospitals with large volume swings may be unable to scale their variable costs to match actual demand. The lack of predictability places these hospitals at greater risk than other hospitals. A hospital with large fluctuations in volume may, for example, require a larger reserve to cushion its operations during periods of low volume. In some years, these hospitals' average costs may approximate or exceed their payment rates, while in others, their low volume may create costs well out of line with payments. It may be difficult for hospitals to survive in the face of such fluctuations in financial performance.

Overall Volume Changes

While the volume of patients has declined for all hospitals, rural hospitals have faced a much greater decline in their patient population. Between the first and sixth years of PPS, the average hospital experienced a cumulative 9.8 percent decline in Medicare discharges. However, more rural hospitals experienced significant declines in patient volume than urban hospitals; for instance, a greater percentage of rural hospitals than urban hospitals lost between 30 and 75 percent of their inpatient volume (see Figure 3-1). Conversely, more urban hospitals gained inpatient volume than rural hospitals.

However, the extent of volume change varied widely among hospitals in both groups. Urban hospitals averaged a 5.6 percent decline in Medicare discharges, while rural hospital discharges decreased an average of 13.8 percent (see Table 3-1). Rural referral centers and larger hospitals experienced less of a decrease in Medicare discharges than other rural hospitals. It is important to note that the decline in volume was actually greater for non-Medicare than Medicare patients (see Table 3-2).

Figure 3-1. Cumulative Volume Changes in Rural and Urban Hospitals, First to Fifth Year of PPS (In Percent)



SOURCE: ProPAC analysis of Medicare Cost Report data.

Table 3-1. Percent Change in Medicare Discharges, by Hospital Group

Hospital Group	TEFRA-PPS 1	PPS 1-2	PPS 2-3	PPS 3-4	PPS 4-5	PPS 5-6	PPS 1-6
All hospitals	-7.4%	-6.4%	-4.8%	-2.2%	1.1%	1.6%	-9.8%
Urban	-6.1	-5.1	-3.4	-1.3	1.4	1.2	-5.6
Rural	-8.7	-7.6	-6.2	-3.1	0.9	2.1	-13.8
Frontier	-14.4	-3.8	-5.3	-2.3	-1.9	4.4	-7.6
Non-frontier rural	-8.0	-8.1	-6.3	-3.2	1.2	1.8	-14.6
Sole community	-8.8	-3.4	-5.5	-2.3	0.2	2.0	-10.0
Rural referral	-5.8	-5.6	-3.2	0.6	2.0	2.6	-3.5
Other rural	-9.1	-9.1	-6.9	-4.0	1.0	2.0	-16.5
Rural <25 beds	-10.8	-9.5	-9.8	-3.7	1.0	0.4	-21.1
Rural 25-49 beds	-10.7	-7.9	-7.2	-4.8	-0.5	2.9	-16.0
Rural 50-99 beds	-7.6	-8.6	-5.6	-2.9	1.0	2.0	-15.6
Rural 100-149 beds	-5.9	-4.3	-4.1	-1.3	3.3	2.1	-5.4
Rural 150-199 beds	-7.6	-5.8	-4.7	-0.9	0.2	1.4	-6.9
Rural 200+ beds	-5.8	-5.2	-2.9	-0.4	3.2	1.2	-3.4

Note: Data for each PPS year corresponds to each hospital's cost reporting period beginning in that year. For instance, the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6.

Data are weighted to the hospital level so that the figures reported represent the average hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

Table 3-2. Percent Change in Total Discharges, by Hospital Group

Hospital Group	TEFRA-PPS 1	PPS 1-2	PPS 2-3	PPS 3-4	PPS 4-5	PPS 5-6	PPS 1-6
All hospitals	-3.9%	-4.9%	-4.0%	-2.7%	-0.1%	0.4%	-13.8%
Urban	-1.1	-2.8	-2.6	-1.8	1.7	0.9	-6.7
Rural	-6.8	-7.1	-5.5	-3.5	-2.0	-0.1	-20.2
Frontier	-15.3	-9.2	-6.1	-4.1	-2.4	-1.1	-25.3
Non-frontier rural	-6.0	-6.8	-5.4	-3.5	-2.0	-0.0	-19.6
Sole community	-2.7	-5.2	-5.0	-3.9	-1.4	-3.1	-20.1
Rural referral	-6.9	-7.9	-0.4	-1.2	1.1	0.4	-8.4
Other rural	-7.7	-6.8	-6.4	-3.9	-2.7	0.7	-22.1
Rural <25 beds	-5.4	-9.3	-7.5	-6.6	-1.4	-2.5	-27.4
Rural 25-49 beds	-9.7	-9.3	-6.7	-3.8	-4.3	-1.5	-25.1
Rural 50-99 beds	-7.3	-7.3	-5.4	-4.1	-1.7	2.0	-20.5
Rural 100-149 beds	-1.2	-2.9	-3.4	-3.0	0.8	0.4	-9.6
Rural 150-199 beds	-7.2	-3.8	-1.3	0.7	-1.1	-2.0	-13.6
Rural 200+ beds	-4.8	0.2	-4.5	-0.9	0.5	0.2	-9.2

Note: Data for each PPS year corresponds to each hospital's cost reporting period beginning in that year. For instance, the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6.

Data are weighted to the hospital level so that the figures reported represent the average hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

As might be expected, there is a relationship between changes in volume and payment to cost ratios.[3] For all hospital groupings, an increase in volume was associated with a more positive change in payment to cost ratios than a decrease in volume (see Table 3-3). Between PPS 5 and PPS 6, rural hospitals that were in the top quartile of change in total volume (e.g., they had the largest increase in total discharges) had a 2.2 percent increase in mean total payment to cost ratio. Rural hospitals in the lowest quartile of volume change (e.g., they had the largest decline in total discharges) experienced a 1.1 percent decrease in mean total payment to cost ratio. A similar relationship exists when the change in Medicare discharges is compared with the change in PPS payment to cost ratios. These relationships hold for urban hospitals and within subgroups of rural hospitals as well.

Table 3-3. Relationship Between Change in Total Payment to Cost Ratios and Change in All Discharges, PPS 5-6

	Change in Total Discharges by Quartile			
Hospital Group	1 (Bottom)	2	3	4 (Top)
All hospitals	-0.8%	0.0%	0.8%	1.6%
Urban	-0.4	-0.5	-0.9	1.1
Rural	-1.1	0.2	1.1	2.2
Frontier	-2.5	-1.8	-0.6	5.3
Non-frontier rural	-0.9	0.4	1.2	1.8
Sole community	-1.5	-0.7	1.1	-0.7
Rural referral	0.4	0.6	1.2	2.1
Other rural	-1.1	0.4	1.2	1.8
Rural <25 beds	-1.8	-0.3	-2.0	3.8
Rural 25-49 beds	-1.5	0.5	-0.6	2.6
Rural 50-99 beds	-1.6	-0.7	-0.9	0.6
Rural 100-149 beds	2.2	-1.5	0.3	1.0
Rural 150-199 beds	-1.8	-1.4	1.8	0.9
Rural 200+ beds	0.6	-0.7	0.1	1.6

Note: Data for each PPS year corresponds to each hospital's cost reporting period beginning in that year. For instance, the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6.

Data are weighted to the hospital level so that the figures reported represent the average hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

Four Cohorts of Volume Experiences

General trends in volume and financial performance indicate the overall relationship between these two indicators but does not tell us how a particular volume pattern is related to these hospitals' financial condition. ProPAC examined the volume experiences of four groups of

[3] The PPS payment to cost ratio is the ratio of PPS payments to Medicare-allowed costs. This measure provides a directly interpretable assessment of Medicare shortfalls or overpayments in percentage terms. A ratio of 1.0 indicates that payments match costs; a ratio of less than 1.0, say 0.97, means that costs exceed payments, in this case by 3 percent; and a ratio greater than 1.0, say 1.04, means that payments exceed costs, in this case by 4 percent.

rural hospitals over time.[4] It was expected that hospitals with consistently declining volume would have relatively low total and PPS margins, and that the converse would be true for hospitals with rising admissions. Hospitals with erratic volume patterns were also examined.

Large Declines--Hospitals with large volume declines had low PPS and total margins (see Table 3-4). Deteriorating PPS margins were associated with rising costs per case (see Table 3-5). PPS costs per case for this group started lower than average in PPS 1 and ended higher than average in PPS 5, growing by 58 percent during this period. Conversely, PPS revenues were only slightly below national averages and rose by a significantly smaller 27 percent during this period. Total admissions fell faster in these hospitals than did Medicare admissions.

Table 3-4. Median PPS and Total Margins in Four Groups of Rural Hospitals

	PPS Margin			Total Margin		
Hospital Group	1984	1986	1988	1984	1986	1988
All rural hospitals	8.4%	3.1%	-2.3%	5.3%	3.3%	3.8%
Large declines[a]	6.0	-5.3	-10.3	2.7	-1.3	-1.4
Small declines[b]	9.4	4.5	-2.0	5.8	4.0	4.1
Increases[c]	9.5	6.5	5.0	4.7	4.8	5.0
Swings[d]	7.9	2.2	1.0	3.2	1.7	2.9

Note: Data are weighted to the hospital level so that the figures represent the average hospital within that group.

[a] Large declines are defined as over 10 percent per year for three out of four year-to-year periods from PPS 1 to PPS 5.

[b] Small declines are defined as 0-10 percent declines per year for three out of four year-to-year periods from PPS 1 to PPS 5.

[c] Increases are defined as positive cumulative changes for the period PPS 1 to PPS 5.

[d] Swings are defined as two modest gains (more than 5 percent) and two large declines (at least 10 percent); or a modest gain followed by a large decline, followed by a modest gain; or a large decline, followed by a modest gain, followed by a large decline. Hospitals with the largest and smallest cumulative volume changes were excluded so that this group would approximate the cumulative volume experience of the small volume decline group, but through a completely different course of volume changes.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

[4] Hospitals with the following volume patterns in three out of the four year-to-year periods from PPS 1 to PPS 5 were studied:

- Large declines, 10% losses per year or more;
- Small declines, 0-10% losses per year;
- Increases, cumulative positive volume change; and
- Swings, two modest gains (more than 5 percent) and two large declines (at least 10 percent); or a modest gain followed by a large decline, followed by a modest gain; or a large decline, followed by a modest gain, followed by a large decline. Hospitals with the largest and smallest cumulative volume changes were excluded so that this group would approximate the cumulative volume experience of the small volume decline group, but through a completely different course of volume changes.

Table 3-5. Mean PPS Costs and Revenues Per Case and Changes in Discharges in Four Groups of Rural Hospitals

Hospital Group	1984	1986	1988	Percent Change 1984-1988
All rural hospitals				
Costs per case	$1,930	$2,307	$2,688	39%
Revenues per case	2,052	2,254	2,531	23
Large declines[a]				
Costs per case	1,759	2,230	2,783	58
Revenues per case	1,816	1,986	2,299	27
Small declines[b]				
Costs per case	2,096	2,435	2,932	40
Revenues per case	2,273	2,526	2,826	24
Increases[c]				
Costs per case	2,034	2,259	2,651	30
Revenues per case	2,211	2,388	2,650	20
Swings[d]				
Costs per case	1,827	2,086	2,502	37
Revenues per case	1,971	2,097	2,446	24

Note: Data are weighted to the hospital level so that the figures represent the average hospital within that group.

[a] Large declines are defined a over 10 percent per year for three out of four year-to-year periods from PPS 1 to PPS 5.

[b] Small declines are defined as 0-10 percent declines per year for three out of four year-to-year periods form PPS 1 to PPS 5.

[c] Increases are defined as positive cumulative changes for the period PPS 1 to PPS 5.

[d] Swings are defined as two modest gains (more than 5 percent) and two large declines (at least 10 percent); or a modest gain followed by a large decline, followed by a modest gain; or a large decline, followed by a modest gain, followed by a large decline. Hospitals with the largest and smallest cumulative volume changes were excluded so that this group would approximate the cumulative volume experience of the small volume decline group, but through a completely different course of volume changes.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

Small Declines--Hospitals with small volume declines had volume, cost, and revenue experiences very similar to the average rural hospital. The hospitals in this group appear to have adjusted to steady volume declines. Their PPS costs per case rose by 40 percent and their PPS revenues rose by 24 percent, resulting in steadily declining PPS margins. However, their total margins were positive throughout the period. As with the large decline group, these hospitals lost more non-elderly patients than they did Medicare patients, although the difference was not as great.

Increases--Hospitals with volume increases began the period with total margins that were lower than average for all rural hospitals and ended with total margins that were higher than average. Again, the change in PPS margins appeared to be driven by costs. PPS costs per case rose 30 percent, while PPS revenues rose by 20 percent, and, as a consequence, PPS margins declined. Both their Medicare and total admissions increased during this period, and their increases in costs per case were lower than average.

Swings--Volume swings did not appear to create the serious financial predicaments that steep volume declines did. Though the cumulative volume change was similar to the small decline group, PPS margins for hospitals with volume swings were higher.

This analysis suggests a relationship between total inpatient admission volume and financial performance. Large volume declines were associated with low PPS and total margins across all rural hospital groups, that were, in turn, related to increasing costs per case. Conversely, volume increases were associated with smaller increases in costs per case and therefore much slower declines in margins. The results may imply that payments that were derived from 1982 costs may not adequately cover the increasing costs per case that have occurred due to volume declines.

Proportion of Fixed Costs

Four recent studies of hospital costs provide strong evidence that changes in volume are associated with less than proportional changes in costs.[5] The proportion of costs that are variable is related to location (urban versus rural), size, and declines in admissions, and are always less than 100 percent. For example, Hadley and Zuckerman estimated that hospitals with low occupancy (under 40 percent) have a smaller proportion of variable costs and higher fixed costs than hospitals with higher occupancy rates (see Table 3-6). This provides evidence of the impact of fixed costs on total costs and indicates that payments based on average costs may under- or over-compensate hospitals with changes in volume.

Table 3-6. Long Run Marginal Cost of a Medicare Case by Hospital Occupancy Rate and Type of Community, 1986

Community Type and Occupancy Rate Group	Average Occupancy Rate	Marginal Cost	Total Variable Cost as a Share of Total Cost	Total Fixed Cost as a Share of Total Cost
Metropolitan				
Above 60 percent	72%	$6,059	83%	17%
40-60 percent	52	3,525	56	44
Below 40 percent	31	824	17	83
All	64	5,502	73	27
Non-metropolitan				
Above 60 percent	70	4,175	66	34
40-60 percent	50	3,471	69	31
Below 40 percent	29	1,402	35	65
All	50	3,288	58	42

SOURCE: Jack Hadley and Stephen Zuckerman, *Hospital Cost Variations Under PPS*, Table 7-5, ProPAC Technical Report E-90-09, November, 1990.

The study by Hadley and Zuckerman also examined the fixed and variable costs for different hospital products, including different kinds of inpatient stays, inpatient days, and outpatient visits. They estimated the percent change in costs associated with a 10 percent decline in each hospital output (see Table 3-7). Changes in all types of outputs led to smaller

[5] See Conrad, R.F. and R.P. Strauss, "A Multiple-Output Multiple-Input Model of the Hospital Industry in North Carolina," *Applied Economics* 15:341-52, 1983; Freiman, M.P. and J. Cromwell, "Reimbursement of Sole Community Hospitals Under Medicare's Prospective Payment System," *Health Care Financing Review* 9(2):39-54, 1987; Hadley, J. and S. Zuckerman, *Hospital Cost Variations Under PPS,* ProPAC Extramural Technical Report No. E-90-09, August 1990; and Pauly, M. and R. Wilson, "Hospital Output Forecasts and the Cost of Empty Hospital Beds," *Health Services Research* 21(3):403-28, August 1986.

changes in total hospital costs. For example, a 10 percent decline in Medicare admissions to rural hospitals results in a 4.7 percent declines in total costs.

Table 3-7. Long Run Percentage Change in Total Hospital Costs Associated With A Ten Percent Change in Outputs, by Community Type

Outputs	Metropolitan	Non-metropolitan
Medicare stay[a]	4.1%	4.7%
Medicare day[b]	2.3	1.9
Medicaid stay	0.9	0.7
Medicaid day	0.4	0.2
Other stay[c]	3.7	2.7
Other day	1.9	1.1
Ambulatory surgery	0.4	0.5
Other outpatient visit	0.2	0.3

[a] Assumes an average number of post-admission days.

[b] Assumes no change in the number of admissions.

[c] "Other" is defined as total less Medicare and Medicaid. It includes privately insured as well as uninsured, workman's compensation, other government programs, and other no charge patients.

SOURCE: Jack Hadley and Stephen Zuckerman, *Hospital Cost Variations Under PPS*, Table 7-4, ProPAC Technical Report E-90-09, November, 1990.

The impact of each output on total hospital costs is proportional to its share of total hospital volume. For example, changes in the volume of Medicare stays leads to a greater change in total costs for rural hospitals than for urban hospitals because Medicare patients make up a larger share of rural hospital patients. Similarly, changes in Medicare *days*, controlling for the number of admissions, has a smaller effect on total hospital costs because days at the end of a hospitalization are relatively low cost.

Policy Implications

Volume changes systematically affect costs per case. The current PPS design results in payments that are inadequate to cover costs for hospitals with declining volume.[6] Depending on the objective(s) of payment policy, these "inaccuracies" could be corrected. However, these modifications would undermine the competitive and incentive aspects of PPS. That is, PPS establishes a system of risks and rewards for individual hospital behavior regarding cost efficiency and practice patterns. Payment policies that soften these incentives, particularly those that approach cost-based reimbursement, will undermine the concepts underlying prospective payment.

Payment policies can be designed to achieve two different policy objectives: to protect hospitals from the consequences of chronic volume reductions; and to relieve hospitals from the

[6] The exception to this statement is the volume adjustment available for sole community hospitals with large volume declines. For SCHs that apply for and receive a volume adjustment, their payments may be brought up to the level of their costs.

effects of temporary, year-to-year volume fluctuations.[7] Policies designed to meet each objective would vary in the way payments would be calculated and the hospitals to which they would apply. Protecting hospitals from financial failure may be incompatible with a payment system that has strong incentives and incorporates prudent purchaser concepts. Moreover, there are other more direct ways to ensure hospital viability.

Over the upcoming year, the Commission will continue to examine the possible payment options to protect hospitals from the financial effects of chronic volume declines. The objectives of such policies and their compatibility with the underlying concepts of PPS will be considered. The current volume adjustment will be evaluated in the context of how to identify hospitals requiring protection and how best to offer this protection. These issues are more fully discussed in Chapter 4.

COMPARISON OF RURAL-BASED AND NATIONAL WEIGHTS

The weight for each DRG is intended to measure the national average resource requirements for Medicare cases in that DRG relative to the national average resource requirements for all Medicare cases. Weights are based on national average standardized charges for all cases in each DRG. The average DRG weight for all of a hospital's Medicare cases is its Medicare case-mix index (CMI).[8] The DRG weights for fiscal year 1991 range from a low of about 0.11 for false labor (DRG 382) to a high of about 15.3 for a liver transplant (DRG 480). Consequently, the DRG weights are one of the most powerful determinants of differences in PPS payments among hospitals.

Rural hospitals have lower case-mix indexes, on average, than urban hospitals. Moreover, CMI values for rural hospitals have not increased as rapidly as those for urban hospitals. This may reflect declining relative resource requirements per case in rural hospitals, relative to those treated in urban hospitals. Alternatively, lower CMIs and slower CMI growth in rural hospitals may reflect biases in the DRG weights that are disadvantageous to rural hospitals. Specifically, the national DRG weights may be so dominated by cases treated in urban hospitals that they provide an increasingly inaccurate measure of differences in relative costliness experienced by rural hospitals.

National weights are increasingly dominated by cases treated in urban hospitals, which currently account for about 80 percent of all Medicare cases. This trend reflects the relative decline in the volume of Medicare discharges in rural hospitals during the last decade. At the same time, the relative importance of technology intensive cases, which are generally treated in urban hospitals, has increased over time. This has occurred because simpler cases have been shifted to other sites of care. In addition, increasing numbers of rural beneficiaries have been travelling to urban hospitals for technology intensive procedures.

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[7] For a more complete discussion of volume adjustments, see Abt Associates, Inc., *Volume Adjustments Used in State Medicaid Programs and Rate Setting Systems*, ProPAC contract No. T-75963392, May 1991.

[8] The CMI reflects the average relative resource requirements of the hospital's Medicare cases, while the base payment amount reflects the level of the hospital's payment per case for a national average Medicare case.

As a consequence of these changing patterns of care, the relative share of urban cases differs substantially among the DRGs. The mix of cases treated by urban and rural hospitals is also increasingly different. Other research also has shown that the cost structures of urban and rural hospitals differ significantly.[9] In addition, the set of services offered in rural hospitals is typically far less extensive than those available in urban hospitals. Moreover, practice patterns and service intensity for the same types of cases continue to differ between urban and rural hospitals. Therefore, it would not be surprising if national weights are increasingly inaccurate as a measure of the relative costliness of cases treated in rural hospitals.

Given separate standardized payment amounts for urban and rural hospitals, the DRG weights are designed to apportion payments among urban and among rural hospitals based on the relative costliness of their cases. If the relative structure of costs among the DRGs were similar for urban and rural hospitals, payments for all cases based on national average weights would correspond to expected costs. The most expensive cases would get the largest payments and the least expensive cases would get the lowest payments. This would be true for both urban and rural hospitals.

However, if the relative structure of costs among the DRGs differed between urban and rural hospitals, the current national relative weights might not be accurate for either hospital group. The most expensive DRG treated in urban hospitals, for example, may not be the most expensive DRG treated in rural hospitals. Generally, this would lead to errors in payment for both urban and rural hospitals. Because cases treated in urban hospitals strongly dominate the current weights, the resulting errors in payments would be greater for rural rather than for urban hospitals. The size of the net payment error for any individual hospital would depend on its mix of Medicare patients. Further, if differences in the relative structure of costs between urban and rural hospitals were increasing over time, then the associated errors in payment would also increase.

A related problem could arise regarding the overall level of payments to urban and rural hospitals. The standardized payment amounts for urban and rural hospitals were calculated, in part, by dividing each hospital's base year costs per case by its case-mix index in the base year. Therefore, the standardized amounts (and the base payment amounts) reflect the national average structure of relative costs among the DRGs that existed in 1981. If the structure of relative costs has been diverging between urban and rural hospitals over time, then the appropriateness of the existing standardized payment amounts would be increasingly open to question.

Analyses

To evaluate these possibilities, separate sets of DRG weights for urban and rural hospitals were calculated and analyzed. This analysis has two components. First, separate sets

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[9] A study conducted by the Center for Health Policy Studies at Georgetown University, under contract to ProPAC (Hospital Cost Variations Under PPS), attempted to identify and measure the relative importance of factors that account for variations in total costs among hospitals. Study findings indicated that different sets of factors affect costs in rural and urban hospitals. Moreover, a number of factors that affect costs in both urban and rural hospitals differ in either the direction or size of their effects in the two settings.

of DRG weights, and their associated CMI values, were calculated for each year from fiscal year 1986 through fiscal year 1991. They were based on the same data and methods that were used to calculate the actual national average DRG weights for each year.

In the second part, the ProPAC payment simulation model was used to calculate estimates of the PPS payments that each hospital would have received during PPS 6 (fiscal year 1989) under two versions of current PPS payment policies: (a) using national average DRG weights, and (b) using separate urban and rural weights. The impact of separate weights on PPS 6 margins under 1991 policies was also estimated.

Separate Urban and Rural Weights and Related CMIs

Separate urban-based and rural-based DRG weights were calculated and compared to nationally-based weights.[10] Because urban cases are predominant, urban-based weights are similar to the national average weights. Rural weights are less like the national weights and have become less similar over time. In fiscal year 1986, about 92 percent of the variation in one set of weights was explained by corresponding variation in the other set of weights -- that is, they were very similar. By fiscal year 1991, this explained variation was only 74 percent.

In addition, the levels of the two sets of weights are quite different. The main reason is that the case-mix of rural and urban hospitals differ substantially, reflecting the lower overall average standardized charges in rural hospitals.[11] As a result, the case-mix index values for rural hospitals based on rural weights are substantially higher than CMIs for the same hospitals based on national average weights. The CMIs for urban hospitals based on urban weights tend to be slightly lower than CMIs based on national weights.

If rural weights were substituted for national weights, the current standardized payment amounts for rural hospitals would be inconsistent with the weights. This is because the original base payment amounts for all hospitals were calculated using national weights. Because the CMIs for rural hospitals based on rural weights are about 15 percent higher than the CMIs based on national weights, the current standardized payment amounts for rural hospitals would be too high. To restore consistency, the rural standardized payment amounts would have to be restandardized using the CMIs based on rural weights. As a result, the standardized amounts for rural hospitals would be reduced by about 15 percent. That is, changes in the overall average level of the weights would be offset by a corresponding reduction in the standardized amounts. A similar offsetting adjustment (in the opposite direction) would be made to the standardized amounts for urban hospitals.

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[10] Separate rural and urban weights for each DRG are calculated by dividing the average standardized charge for all cases in the DRG by the overall average standardized charge for all cases in all DRGs. The only difference is that the DRG-specific and overall averages used to calculate separate urban and rural weights are based only on the cases treated in the particular hospital group.

[11] Because the average standardized charge is the denominator for the two sets of relative weights, the rural weights for DRGs common to both urban and rural hospitals tend to be about 15 percent higher than the corresponding urban weights.

Impact on Payments and PPS Margins

As noted earlier, payments were estimated using national and urban- and rural-based weights. The standardized amounts were adjusted to maintain consistency between the weights and the standardized amounts. Overall budget neutrality was maintained, so that overall aggregate payments to all hospitals would not differ from the aggregate payments that actually occurred during PPS 6.

Results indicate that the use of separate urban and rural weights would not substantially change overall payments or PPS margins for different hospital groups. However, many individual hospitals within each hospital group would be substantially affected, with margins shifting up or down by as much as five percentage points. This indicates that using separate DRG weights would redistribute money from some hospitals within each hospital group to other hospitals within the same group, although the group as a whole might not be affected. This raises important questions about the distributional equity of the current system of national DRG weights.

The effect of using separately computed urban and rural weights on payments to rural hospitals is not very large (see Table 3-8). Payments per case increase on average only 0.8 percent for rural hospitals, and decrease 0.1 percent for urban hospitals. The largest increases in payments are to rural referral centers (1.7 percent), and large rural hospitals. Nevertheless, if there are any substantial redistributive effects among rural hospitals, it is not evident among the groups examined in this study.

Table 3-8. Percent Change in Payments Per Case in PPS 6 Between 1991 Policy with National Weights and 1991 Policy with Separate Urban and Rural Weights

Hospital Group	Percent Change
Total	0.0%
Urban	-0.1
Rural	0.8
Rural referral	1.7
Sole community	0.4
Other rural	0.1
Rural <50 beds	-0.4
Rural 50-99 beds	0.2
Rural 100-149 beds	1.0
Rural 150-199 beds	1.2
Rural 200+ beds	1.6

Note: Standardized amounts have been computed assuming restandardization and budget neutrality.

SOURCE: ProPAC estimates based on ProPAC PPS payment model and fiscal year 1989 MedPAR file data from the Health Care Financing Administration.

Similarly, there are no strong effects on PPS margins among groups of rural hospitals (see Table 3-9). The margin of the typical rural hospital decreased from -0.5 percent using national weights to -0.7 percent using separate urban and rural weights. Similarly, the median margin for urban hospitals increased from -3.4 percent to -3.3 percent when urban and rural weights were substituted for national weights. Using separate urban and rural weights did not change margins by even a percentage point in any hospital group. Therefore, using national weights does not appear to differentially harm or help any specific group of rural hospitals, on average.

Table 3-9. Median PPS 6 Margins, Using National and Separate Urban and Rural Weights with 1991 Policy

Hospital Group	1991 Policy National Weights	1991 Policy Separate Rural Weights*
Total	-2.1%	-2.2%
Urban	-3.4	-3.3
Rural	-0.5	-0.7
Rural referral	-2.6	-1.3
Sole community	1.3	1.6
Other rural	-0.8	-1.3
Rural <50 beds	1.4	0.8
Rural 50-99 beds	-1.0	-1.0
Rural 100-149 beds	-3.0	-2.5
Rural 150-199 beds	-0.7	0.4
Rural 200+ beds	-4.7	-3.4

* Standardized amounts have been computed assuming restandardization and budget neutrality.

SOURCE: ProPAC estimates based on ProPAC PPS payment model and fiscal year 1989 MedPAR file data from the Health Care Financing Administration.

While there appear to be no effects by hospital grouping, separate urban and rural weights would increase payments to some individual hospitals while reducing payments to other hospitals within every hospital group. The distribution of margins within each hospital group shows that even with separate weights, PPS margins would remain highly variable within every hospital group (see Table 3-10). Rural hospitals falling into the bottom 10th percentile of margins would have a margin of -26 percent or lower, while the rural hospital falling into the top 10th percentile would have a margin of 18.5 percent or higher, assuming 1991 policy and separate urban and rural weights. Using separate weights would not reduce significantly the wide variation in margins that currently prevails in all hospital groups.

Table 3-10. Distribution of PPS 6 Margins, Using Separate Urban and Rural Weights and 1991 Policy

Hospital Group	Percentile				
	10th	25th	Median	75th	90th
Total	-26.3%	-13.7%	-2.1%	8.8%	17.7%
Urban	-26.3	-14.4	-3.2	7.4	16.4
Rural	-26.3	-12.8	-0.6	9.8	18.5
Rural referral	-17.5	-8.9	-1.3	8.8	17.4
Sole community	-23.9	-11.0	1.7	13.5	24.0
Other rural	-28.0	-14.2	-1.2	9.1	17.4
Rural <50 beds	-30.3	-14.1	0.9	11.9	21.6
Rural 50-99 beds	-24.8	-12.2	-0.9	8.4	16.4
Rural 100-149 beds	-23.1	-12.3	-2.4	8.9	16.0
Rural 150-199 beds	-21.8	-10.2	0.5	6.8	15.5
Rural 200+ beds	-18.7	-9.2	-3.3	5.4	14.4

Note: Standardized amounts were computed assuming standardization and overall budget neutrality.

SOURCE: ProPAC estimates based on ProPAC PPS payment model and fiscal year 1989 MedPAR file data from the Health Care Financing Administration.

However, using separate rural and urban weights would change how much better or how much worse hospitals would fare under PPS when compared to national weights. Rural hospitals would be affected more than urban hospitals (see Table 3-11), with their margins increasing and decreasing by more percentage points than urban hospitals. Under separate weights, PPS margins for rural hospitals with the largest declines in margins (the 10th percentile of distribution of margin changes) would decrease by -2.7 percentage points or more, compared with -0.7 or more percentage points for urban hospitals. Increases in margins for hospitals with the largest gains (the 90th percentile) show the same pattern: rural hospitals would gain 2.8 percentage points or more, while urban hospitals would gain 1.1 percentage points or more.

Table 3-11. Distribution of Differences in PPS 6 Margins Between National and Separate Urban and Rural Weights Using 1991 Policy (In Percent)

Hospital Group	Percentile				
	10th	25th	Median	75th	90th
Total	-2.0%	-0.7%	0.2%	0.8%	1.8%
Urban	-0.7	-0.2	0.3	0.6	1.1
Rural	-2.7	-1.6	-0.3	1.4	2.8
Rural referral	0.9	1.3	1.6	1.9	2.4
Sole community	-4.6	-1.9	-0.4	2.8	4.2
Other rural	-2.6	-1.7	-0.6	0.6	2.0
Rural <50 beds	-3.2	-2.1	-1.0	0.4	3.1
Rural 50-99 beds	-2.4	-1.4	-0.5	1.0	2.9
Rural 100-149 beds	-1.4	-0.3	0.9	1.7	2.5
Rural 150-199 beds	-0.3	0.5	1.5	1.8	2.3
Rural 200+ beds	0.4	1.0	1.6	1.8	2.3

Note: Standardized amounts for separate rural weights were computed using restandardization and budget neutrality.

SOURCE: ProPAC estimates based on ProPAC PPS payment model and fiscal year 1989 MedPAR file data from the Health Care Financing Administration.

It is also apparent that the magnitude of changes in margins associated with the use of separate weights would vary among hospital groups, because of differences in hospital size (see Table 3-11). Small hospitals would tend to have the largest increases and decreases in PPS margins while large hospitals would experience relatively smaller changes in margins in both directions. Sole community hospitals would have the widest range of margin changes under separate weights compared to national weights.

A further analysis examined whether hospitals that performed poorly under national weights benefitted substantially from separate weights, and whether hospitals that performed well under national weights were hurt or helped even more by separate weights. For most hospital groups, the results showed that hospitals that fare poorly under current policy would have about an equal chance of a large increase or a large decrease in PPS margins under a policy of separate weights. Similarly, hospitals that fare well under current policy would have about the same likelihood of doing better or worse under separate weights.

Implications of Separate Weights

The use of national weights to pay both urban and rural hospitals was implemented under the assumption that the relative cost structures of urban and rural cases are similar. The results of this analysis suggest that this assumption may be increasingly inappropriate. When separate urban and rural weights are computed, the distribution of the rural weights is not the same as the distribution of national weights, and the divergence seems to be widening over time. Therefore, the use of national weights for rural hospitals appears to cause errors in payment, and the magnitude of those errors has been increasing as the mix of cases treated in urban and rural hospitals has changed over time.

However, it is also evident that these payment errors do not affect groups of rural hospitals differentially, on average. That is, most hospital groups do not appear to be systematically overpaid or underpaid with the use of current national weights. Rather, the errors in payment are hospital-specific. When rural-based weights are estimated, some hospitals within each group have better financial performance and some have worse. Moreover, a policy of separate urban and rural weights does not appear to systematically help "losers" under current policy or hurt the "winners" -- it simply affects some individual hospitals within each group and not others. This may mean that payment errors under the current policy of national weights have no systematic relationship to the major sources of differences in financial performance under PPS, such as declines in the volume of discharges, low occupancy rates and other factors.

Therefore, changing policy to incorporate separate urban and rural weights would probably not improve the financial performance of rural hospitals overall, or of any subgroup of rural hospitals. Yet, such a policy would increase the accuracy of current payments for many individual hospitals. Nevertheless, whether the gain in accuracy would be sufficient to justify the adoption of separate weights remains unclear.

In this context, it should noted that this analysis did not address how changes in the weights would interact with other policies, such as the teaching adjustment, outlier thresholds and payments, or the scheduled elimination of the differential between the urban and rural standardized amounts. Moreover, the rural weights calculated for this analysis were based on all

cases treated in rural hospitals. This includes rural referral centers, which account for about one-third of all rural discharges. Because these hospitals may have a relative cost structure more similar to the structure in urban hospital than in other rural hospitals, the results of the current study may understate the impact of adopting separate weights. Therefore, this and other issues will remain on the Commission's agenda for further analysis.

RURAL AND URBAN DEFINITIONS OF OUTLIER CASES

Outliers are defined using the distribution of costs and lengths of stay of all cases. Hospitals with lower volume are likely to be at greater financial risk to the losses associated with outlier cases than hospitals with higher volume. Low volume hospitals have fewer cases over which to spread these losses and are likely to be devastated by much smaller losses on any given case. Therefore, rural hospitals may be at greater financial risk due to the losses associated with outliers.

However, if separate definitions of outliers were established, it is not clear that this lower threshold would benefit most rural hospitals. This is because the lower threshold would "catch" more cases that would, in turn, require financing. Because outliers are financed by an across-the-boards assessment, the rural standardized amount would be lowered to finance the greater number of outliers.

Most rural hospitals are, or should be, at low risk of treating an outlier case, because most potential outlier cases in rural hospitals are transferred. Many rural hospitals are likely to be better off with the current outlier policies that result in higher standardized amounts. Although a modified outlier policy would benefit those rural hospitals with outlier cases, most rural hospitals do not treat an outlier case in a given year. This tradeoff between higher standardized amounts and the increased protection against an unlikely event offered by lower thresholds is the central issue in modifying the current rural outlier payment policy.

SYSTEMATIC VERSUS RANDOM RISK

Underlying this discussion of rural hospitals is the notion of systematic versus random risk. PPS assumes that hospitals will operate under conditions of systematic risk that can be reasonably planned for and thus would not create biases against certain groups of hospitals. Most of the potential problems discussed here -- volume declines raising fixed costs per case, the use of national weights, the fixed labor share and the definitions of market area -- involve systematic risk that would, in theory, be adequately adjusted for if current policies were accurate.

Conversely, hospitals with smaller caseloads are exposed to greater random risk. This is because hospitals treating fewer cases will have more variability in the cases treated.[12] Hospitals with low volume will be less able to spread the losses on an extreme cases over the

[12] A fundamental concept in statistics is that as sample size increases the variance decreases.

other cases treated. This volatility in the mix of cases will be tempered by the fact that, on average, small rural hospitals treat a more homogeneous mix of cases. PPS does not adjust for the effects that random risk may have on hospitals.

INCORRECT ADJUSTMENTS AFFECTING ALL HOSPITALS

It is possible that some of the original adjustments may be misspecified and may result in inaccurate payments for all hospitals. Two such adjustments are: the fixed nature of the proportion of costs adjusted for differences in wage rates, and the inadequate definition of market areas used to adjust labor costs. Because labor costs are over 70 percent of hospital costs, these policies have important implications for all hospitals' payments. Both of these issues were considered beyond the timeframe of this report but will be addressed as part of ProPAC's analytic agenda for the upcoming year.

Fixed Labor Proportion

The portion of hospital costs adjusted for differences in local wages is fixed at the national average. This average proportion is then applied to all hospitals and all types of cases. However, the labor share in rural hospitals is generally lower than the average used in the payment system. As a result, the proportion of rural hospital payments that is adjusted by the wage index is larger than their actual share would indicate. Further, the wage index values in rural areas are generally less than 1.0. When combined with the larger than actual labor share, rural hospital costs are reduced by more than they would be if they were based on the actual labor share. Thus, the fixed labor share may result in underpayments to rural hospitals. Underpayments may also arise for those cases that consume higher than average labor resources.

Definition of Labor Markets

Payments to all hospitals are adjusted by the area wage index to reflect local difference in the cost of labor. However, the labor markets definitions used in PPS are unlikely to reflect actual labor markets. For rural hospitals, all rural counties in the state are pooled into one labor market area. For urban hospitals, all hospitals within the MSA are classified into one labor market. These definitions ignore sub-state and sub-MSA variations in wage levels that exist, create artificial boundaries at state lines, and create boundary inequities between rural and urban areas. Over 700 rural hospitals have sought redesignation into urban labor markets and about 200 urban hospitals have sought classification into different MSAs. These staggering statistics are testimony to the inaccuracies and perceived inequities resulting from the current definitions.

Over the next year, ProPAC will be examining the issue of labor markets areas in considerable detail. The Commission will consider defining hospital-specific labor market areas to significantly reduce the inequities created by the current definitions. These analyses and results will be reported in future ProPAC reports.

SUMMARY

PPS includes several features that expose rural hospitals to more risk than urban hospitals. The most basic problem faced by rural hospitals stems from their lower volume that undermines their ability to average costs between cases and to have sufficient cases over which to spread their fixed costs. While payment adjustments are possible, they would jeopardize the foundation of the payment system to pay fair rates to efficiently run hospitals with adequate volume. Further, there may be other, more direct ways to offer protection to those hospitals that are required to maintain beneficiary access. Over the next year, the Commission will discuss the feasibility and desirability of changes in the payment system to protect these hospitals.

The analysis of rural- and urban-based weights revealed what while national weights do not disadvantage any hospital group, they do result in inaccurate payments to some hospitals. Although separate weights would yield more accurate payments, they would necessitate recalculation of the standardized amounts. The Commission will discuss the desirability of this payment change as well.

Other PPS design features result in inaccurate payments to all, not only rural, hospitals. The use of a fixed labor share and the current labor market areas result in incorrect payments to many hospitals. During the next year, the Commission will consider alternative definitions to improve on these features of PPS.

Chapter 4

Do Certain Hospitals Need Protection?

Historically, certain rural hospitals have been afforded special treatment under Medicare. Prior to PPS, sole community hospital (SCH) designation exempted hospitals from the cost limits for two reasons: (a) to ensure that hospitals would not bill beneficiaries for additional charges, and (b) to ensure that beneficiaries would not be turned away from facilities because of insufficient Medicare payment. Under PPS, the focus of SCH designation was to provide additional payment to protect isolated hospitals from insolvency, thereby maintaining Medicare beneficiaries' access to hospital care. In isolated areas with only one hospital, hospital insolvency and closure would be unduly burdensome because residents would have to travel long distances for care. Although the existence of a hospital does not imply that area residents have access to needed care, it has been used in the Medicare program as a reasonable approximation.

This analysis of SCHs was conducted to answer three policy questions. First, do the current SCH criteria identify the right group of hospitals for special protection? Second, do those hospitals that no longer meet the current criteria but are grandfathered under previous rules warrant continued protection? Finally, are subgroups of SCHs, such as those located in areas with low population density, performing poorly and require special assistance?

The policy questions addressed in this analysis relate to two basic issues regarding SCHs. The first issue is whether PPS payments are adequate for SCHs. Numerous policy changes have been enacted in 1990 and 1991 to increase payments to rural hospitals, especially to SCHs. Analyses indicate that these policies had their desired effect and have substantially improved the financial performance of SCHs. However, the overall improvement in financial performance may have masked the poorer performance of some subgroups of SCHs. To determine whether the policies have achieved their goals for all subgroups of SCHs, the financial performance of the most isolated hospitals was examined in more detail. This analysis will help determine whether additional assistance to rural hospitals is required at this time.

The second issue is whether the current criteria for SCH designation appropriately identify the hospitals necessary to assure beneficiary access. The current criteria are based on isolation and protection for hospitals that are the sole providers for beneficiaries in their market area. At face value, these criteria appear reasonable. However, the criteria could be redefined to relate more closely to the policy goal of increased beneficiary access to care. Additionally, given the fiscal constraints on the Medicare program, additional payments may need to be targeted only to hospitals that meet the criteria *and* are doing poorly. Further analysis of the current criteria will provide information to guide this policy decision.

This chapter examines the characteristics and financial performance of SCHs. It begins with a discussion of how the hospitals qualified for SCH status, and focuses on the hospitals' service offerings, patient characteristics, and financial performance. The characteristics of SCHs that differ from other rural hospitals are highlighted. Because hospital characteristics and financial performance are strongly influenced by hospital size, SCHs were also compared to rural hospitals of similar size, as well as rural hospitals that have similar average daily census. Next, subgroups of SCHs were examined. In particular, differences between SCHs that currently

meet the SCH criteria and those that have been grandfathered under previous rules were identified. Also, the characteristics and financial performance of SCHs located in isolated areas with low population density are examined, since the closure of these hospitals might provide a significant barrier to residents' access to care.

SOLE COMMUNITY HOSPITAL DESIGNATION

The current SCH designation is intended to identify hospitals that are the only providers of hospital care in their market area, and may be a reasonable approximation of those hospitals required for beneficiary access. Currently, a rural hospital meeting one of the following criteria may be designated as an SCH:

(a) located more than 35 miles from the nearest hospital;

(b) located between 25 and 35 miles from the nearest hospital *and*

  (i) has 75 percent of the market share (either Medicare or total discharges) *or*

  (ii) has at least 50 beds and is certified by the PRO or fiscal intermediary (FI) that it would have had 75 percent of the market share if it had sufficient specialty services;

(c) located 15 to 35 miles from the nearest hospital and is isolated at least one month of the year due to severe weather condition;

(d) travel time to the nearest hospital exceeds 45 minutes.

In addition, hospitals that were designated as an SCH prior to PPS, but no longer meet the current criteria, can retain their designation under a grandfather provision.

Prior to 1990, SCHs were paid a blended amount: 75 percent hospital-specific costs and 25 percent the regional Federal rate. After April 1, 1990, SCHs have been paid under new rules. They receive the higher of their 1982 costs trended forward, their 1987 costs trended forward, or the Federal rate. Many SCH-eligible hospitals recently chose to be designated SCHs because of these more generous payment policies. In fact, the number of SCHs has increased by 70 percent (219 hospitals) since 1989. In addition, SCHs are eligible to apply for a volume adjustment if patient discharges drop five percent or more in one year and Medicare costs exceed Medicare payments. If the SCH volume adjustment application is approved, the hospital can receive additional payments up to its PPS costs.

Throughout this analysis, several groups of SCHs are considered:

- all current SCHs,

- SCHs that became designated after the new payment provisions took effect December 19, 1989 (New),
- SCHs designated before December 19, 1989 (Old),
- SCHs that do not meet current criteria (Grandfathered), and
- SCHs that are located in frontier areas (Frontier).

The analyses in this chapter are based on 535 SCHs (see Table 4-1).[1] The largest group of these hospitals, 45 percent, were designated SCHs based on the distance criterion for eligibility.[2] The market share criteria were used by 20 percent of qualifying hospitals, and travel time by less than 10 percent. Few hospitals were designated SCH under the weather criterion. About 20 percent of the hospitals were grandfathered.[3] It should be noted that these data represent the criteria the hospitals elected to meet; hospitals may been able to qualify under more than one criterion.

Table 4-1. Sole Community Hospital Qualifying Criteria, 1991

Criteria	Number of Hospitals	Percent
Distance	243	45%
Market share	107	20
Travel time	49	9
Weather	8	2
Grandfathered	109	20
Missing data	19	4
Total	535	100

Note: Our analysis excludes 78 SCHs that were also rural referral centers; have since closed or terminated SCH status; or were missing AHA survey, MedPAR, or MCR data for 1989.

SOURCE: ProPAC analysis of data provided by HCFA Bureau of Policy Development, HCFA regional offices, and Lewin/ICF under contract to ASPE.

[1] Currently, there are 613 hospitals designated SCHs. However, SCHs that are also rural referral centers (49 hospitals), those that have recently closed or terminated SCH status (10 hospitals), those for which there are no 1989 MedPAR, AHA survey, or MCR data (17 hospitals), and hospitals located in the Finger Lakes district in New York (2 hospitals) were excluded from the analysis, leaving a total of 535 hospitals.

[2] Hospitals apply initially to the FI for SCH designation. The FI makes a recommendation regarding the application to the HCFA Regional Office, which approves or disapproves the request.

[3] Missing data were a problem in this analysis. For those hospitals for which information on how they initially qualified as a SCH was unavailable, alternative data sources were used to calculate distance, market share, travel time, and weather due to snowfall, in order to assign them to the appropriate category. Missing data on 19 (4 percent) of the hospitals prevented assignment of any criteria to these hospitals. The imputation of a designation by the PRO or FI for those hospitals meeting the criteria of potential market share if they had additional specialty services, or that met weather conditions other than snow was not possible. Therefore, hospitals falling into these two categories may have been erroneously assigned to the grandfathered category. Hospitals failing to meet any of the criteria, and not missing data, were assigned to the grandfathered category.

The criteria hospitals used to qualify as SCHs varies considerably by region of the country. Almost three-quarters of the SCHs in the Middle Atlantic region qualified for SCH status by using the distance criterion. In the South Atlantic, Mountain, and Pacific regions, about half of the SCHs qualified by using the distance criterion, while in the remaining regions, less than one-third qualified for that reason. The majority of hospitals in the East and West South Central regions qualified through the market share criteria. The majority of the grandfathered hospitals are located in the Mountain (41), Pacific (21), West North Central (19), and West South Central (12) regions.

There are currently 22 urban SCHs. At least some of these hospitals are located in large western counties that span hundreds of miles. The majority of these urban SCHs are grandfathered.

Hospitals located in counties with low population density, called frontier hospitals, might be especially isolated; over 65 percent of frontier hospitals are designated SCHs. Surprisingly, only about 60 percent of these hospitals were designated using the distance criteria. Almost 16 percent of these hospitals were grandfathered.

OBRA 1989 made it financially more advantageous for rural hospitals to become SCHs, and as a result a large number of eligible hospitals applied for SCH designation. About half of these new SCHs qualified under the distance criteria, and one third due to market share.

A large number of SCHs were certified as such because, although they do not meet the distance, travel time, or weather criteria, they serve as the sole provider for residents in their area, and thus presumably meet the market share requirement. Analysis of Medicare market share data provides some interesting insight as to the extent to which the SCHs are the sole providers of care in their area. Of the 535 hospitals designated as SCHs, only 13 (3 percent) provide services to more than 75 percent of Medicare beneficiaries in their area (see Table 4-2).

Table 4-2. Market Share Distribution of Sole Community Hospitals

Medicare Market Share	Number of Hospitals	Percent
>75 percent	13	3%
65-74 percent	57	12
55-64 percent	99	21
45-54 percent	109	23
35-44 percent	70	15
<35 percent	121	26

Note: Data are missing for 66 hospitals.

SOURCE: ProPAC analysis of data provided by HCFA Bureau of Policy Development, HCFA regional offices, and Lewin/ICF under contract to ASPE.

Even the hospitals that qualified as SCHs using the market share criteria, only 3 (4 percent) provide services to more than 75 percent of Medicare beneficiaries in their area (see Table 4-3). Of course, Medicare market share is not the only criteria used in determining eligibility -- total market share as well as designation by the PRO or FI under special circumstances are additional criteria. However, it is unlikely that total market share would be orders of magnitude different from Medicare market share. This analysis casts doubt on the

claim that SCHs are truly the sole providers of service for Medicare beneficiaries in their area. Further, it suggest that most hospitals using the market share criterion for designation obtain certification from the PRO or FI. This 'exceptions route' appears to be driving the eligibility for this criterion.

Table 4-3. Market Share Distribution of Sole Community Hospitals Qualifying Under the Market Share Criterion

Medicare Market Share	Number of Hospitals	Percent
>75 percent	3	4%
65-74 percent	5	6
55-64 percent	14	18
45-54 percent	20	26
35-44 percent	7	9
<35 percent	29	37

Note: Data are missing for 29 hospitals.

SOURCE: ProPAC analysis of data provided by HCFA Bureau of Policy Development, HCFA regional offices, and Lewin/ICF under contract to ASPE.

CHARACTERISTICS OF SOLE COMMUNITY HOSPITALS

As of 1989, the average SCH was small, with about 50 acute beds (see Table 4-4). While virtually all of the SCHs had an emergency room and the capability to provide basic diagnostic services, such as laboratory services, only 54 percent had an intensive care unit. As expected, SCHs tend to be located far from other hospitals; the average distance to the nearest hospital was 38 miles. The average occupancy rate among SCHs was 37 percent. Approximately 41 percent of cases at SCHs were Medicare beneficiaries, and 7 percent of cases were Medicare-Medicaid dual eligibles.

Because SCHs are not a homogeneous group, the characteristics of three groups of SCHs were analyzed separately using the groups previously described: new, old, grandfathered, and frontier. Grandfathered and old SCHs tend to have a lower proportion of their beds designated for long-term care use than new SCHs (see Table 4-4). New SCHs are less likely to have an ICU, but serve a larger Medicare share than old and grandfathered SCHs. Frontier SCHs tend to be farther from the nearest hospital (45 miles on average) than other SCHs. Grandfathered SCHs tend to be closer to the nearest hospital than the other two groups, with an average distance of 23 miles to the nearest hospital.

Table 4-4. Characteristics of Sole Community Hospitals

Characteristics	Sole Community Hospitals					Other Rural Hospitals		
	All	Grand-fathered	Old[a]	New[b]	Frontier[c]	All	Similar Size[d]	Similar ADC[e]
Acute beds	50	51	53	45	28	53	33	32
Occupancy rate	37	38	37	35	28	27	32	29
Percent of beds designated long-term care	37	38	32	41	51	34	42	44
Percent of hospitals with intensive care units	54	56	61	46	29	53	25	23
Percent of hospitals with emergency rooms	98	98	98	98	98	97	97	97
Percent of hospitals with laboratories	100	100	100	100	100	100	100	100
Medicare share	41	39	39	45	41	45	49	49
Dual eligible share	7	7	5	9	5	5	5	5
Miles to nearest hospital	38	23	44	37	45	22	22	22
Number of hospitals	535	109	207	219	193	1,737	649	535

Notes: Data are weighted to the hospital level so the figures reported represent the average hospital within that group.

[a] Hospital designated SCH on or before December 19, 1989.

[b] Hospital designated SCH after December 19, 1989.

[c] All SCHs located in counties with population density less than 6 square miles. Includes grandfathered, old, and new SCHs.

[d] Size 24-49 beds.

[e] Average daily census 5-14.

SOURCE: ProPAC analysis of data provided by HCFA Bureau of Policy Development, HCFA regional offices, and Lewin/ICF under contract to ASPE.

The average financial performance of SCHs under Medicare was poor in 1989 (see Table 4-5). The average PPS margin was -9.7 percent. However, this masks significant variation in performance among groups of SCHs. New SCHs had much better financial performance than old and grandfathered SCHs; their PPS margins were -5.1 percent, compared to -13.2 percent for grandfathered and -12.7 percent for old SCHs.[4] When the total financial performance of SCHs is examined, a similar relationship holds. Total margins are higher than PPS margins, and are greater than zero except for frontier hospitals. New SCHs have higher total margins than old and grandfathered SCHs.

[4] New SCHs are those that were designated after 1989. Therefore, in 1989 they were not yet designated as SCHs, and were not receiving the additional payments.

Table 4-5. Mean PPS and Total Margins of Sole Community and Other Rural Hospitals, 1989

Margin	Sole Community Hospitals					Other Rural Hospitals		
	All	Grand-fathered	Old[a]	New[b]	Frontier[c]	All	Similar Size[d]	Similar ADC[e]
PPS	-9.7%	-13.2%	-12.7%	-5.1%	-10.6%	-6.7%	-6.0%	-4.5%
Total	1.7	0.7	1.5	2.3	-0.2	1.7	0.7	1.1

Note: Data are weighted to the hospital level so the figures reported represent the average hospital within that group.

[a] Hospital designated SCH on or before December 19, 1989.

[b] Hospital designated SCH after December 19, 1989.

[c] All SCHs located in counties with population density less than 6 square miles. Includes grandfathered, old, and new SCHs.

[d] Size 24-49 beds.

[e] Average daily census 5-14.

SOURCE: ProPAC analysis of data provided by HCFA Bureau of Policy Development, HCFA regional offices, and Lewin/ICF under contract to ASPE, and Medicare Cost Report data from 1989.

Because rural hospitals were doing worse under PPS than urban hospitals, numerous policy changes were enacted since the inception of PPS. In particular, changes made in OBRA 1989 and OBRA 1990 increased payments to all rural hospitals, but especially to SCHs. Since the most recent payment and cost data (1989) do not reflect these changes, ProPAC modelled 1991 payment rules on 1989 data to estimate how rural hospitals would be faring under current payment rules. In general, the changes in payment policy for all rural, and SCH in particular, have had their intended effect. In fact, rural hospitals would have been doing as well or better than urban hospitals, with SCHs doing the best of all rural hospital categories. (See Chapter 2, Table 2-9, for a complete listing of the impacts of 1991 rules.)

Estimated 1989 PPS margins for SCHs would have improved considerably under current rules. PPS margins rose by almost 10 percentage points and were about zero for the group as a whole (Table 4-6). There is significant variation in SCH financial performance. New SCHs have the best PPS performance (margins of 5.8 percent), while old SCHs have the worst (margins of -4.5 percent). Notably, frontier SCHs have positive average PPS margins. The estimated total Medicare costs for the new SCH payment rules was about $65 million. Likewise, the estimated average total margins rose significantly, and ranged from 1.8 percent to 5.0 percent. These total margins indicate that additional payments targeted at all SCHs are not warranted.

Table 4-6. Mean PPS and Total Margins in Sole Community Hospital Under Various Policies

Sole Community Hospital Group	Number of Hospitals	1989 Actual		New Payment Rules		New Payment Rules and Automatic Volume Adjustment	
		PPS	Total	PPS	Total	PPS	Total
All	557	-9.8%	1.4%	-0.1%	3.5%	1.4%	3.7%
New	227	-5.2	1.8	5.8	5.0	6.8	5.2
Old	210	-12.6	-1.5	-4.5	3.0	-2.8	3.3
Grandfathered	108	-14.2	0.3	-3.2	1.8	-1.4	1.9
Frontier	192	-10.6	-0.4	2.3	2.4	3.4	2.6

Note: Margins are hospital-weighted providing a measure of the average hospital's experience. Data from 12 SCHs were missing.

SOURCE: ProPAC analysis of data provided by HCFA Bureau of Policy Development, HCFA regional offices, and Lewin/ICF under contract to ASPE, and Medicare Cost Report data from 1989

In addition to the impact of the new payment rules, ProPAC examined the impact of the volume adjustment for qualifying SCHs. The analysis assumed that all hospitals that would have qualified for a volume adjustment would have applied, been approved, and received payments up to their PPS costs (essentially making the volume adjustment automatic).[5] It thereby represents an upper estimate on its impact on hospital performance. When an automatic volume adjustment was modeled in addition to the new payment rules, both sets of average margins rose somewhat more. PPS margins increased by one or two percentage points above the new payment rule levels, and total margins rose by one to three tenths of a percentage point. The estimated additional total program cost for the volume adjustment was $14 million.

Within SCH groups, new SCHs, those designated after 1990, were in the strongest financial position, in 1989 and under current 1991 rules. It appears that it was very advantageous for the new SCHs to elect SCH designation, and their PPS margins went from -5.2 percent to an estimated 5.8 percent with the new rules. The automatic volume adjustment was most beneficial for the old SCHs -- they gained about two percentage points. Frontier SCHs gained close to 12 percentage points on their PPS margins with the new payment rules, resulting in PPS margins of 2.3 percent. With an automatic volume adjustment, their average PPS margin rose an additional percentage point.

In conclusion, it is evident that the new SCH payment rules were effective in improving SCH financial performance. PPS margins were estimated to rise by close to 10 percentage points with the new rules. When an automatic volume adjustment was modeled in addition, PPS margins rose by another couple of percentage points. The new payment rules had a strong positive effect on both PPS and total margins, and an automatic volume adjustment had an additional smaller positive effect. Under 1991 rules, total margins indicate that all SCHs, including frontier SCHs, are faring relatively well and do not warrant additional protection at this time.

HOW DIFFERENT ARE SCHs FROM OTHER RURAL HOSPITALS?

To assess the continued desirability of providing additional payments to SCHs, it is important to understand how SCHs differ from other rural hospitals. In this analysis, SCHs were compared to all other rural hospitals (excluding rural referral centers), and to specific subsets of rural hospitals that resemble SCHs in terms of hospital size and average daily census.

Compared to all rural hospitals, SCHs are slightly smaller than other rural hospitals (50 versus 53 beds on average), although the average daily census is similar (see Table 4-4, column 6). SCHs are somewhat more likely to provide long term care services than other rural hospitals, although their tendency to provide other specialty services, such as ER, laboratory, and intensive care, are similar. Other rural hospitals are located closer to the nearest hospitals, on average. The average rural hospital is located 22 miles from the nearest hospital, compared to 38 miles for the average SCH. However, the distance between hospitals almost the same for grandfathered SCHs and other rural hospitals. All other rural hospitals serve a larger share of

[5] In the model, those SCHs that lost more than five percent of total admissions from PPS 5 to PPS 6 and still had PPS costs in excess of the new 1991 policy payments received PPS payments to match PPS costs.

Medicare patients than SCHs (45 versus 41 percent), although SCHs serve slightly more poor elderly, as measured by Medicare-Medicaid dual eligibles. The Medicare share for other rural hospitals is similar to the new subgroup of SCHs.

In terms of their financial performance, on average SCHs were doing worse financially than other rural hospitals under PPS (see Table 4-5). In 1989, PPS margins in SCHs were -9.7 percent, compared to -6.7 percent in other rural hospitals. Only 31 percent of SCHs had PPS margins that were greater than zero, compared to 44 percent of other rural hospitals. However, new SCHs were performing as well or better than other rural hospitals on both measures of financial performance. In 1989, total margins were between 1 and 2 percent for both SCHs and other rural hospitals. The proportion of hospitals with positive total margins was 62 percent in SCHs and 65 percent in other rural hospitals.

Comparing SCHs with other small rural hospitals, SCHs tend to have slightly higher (37 versus 32 percent) occupancy rates (see Table 4-4, column 7). Other small rural hospitals are as likely to provide emergency room and laboratory services, but only half as likely to offer intensive care services (25 versus 54 percent). Other small rural hospitals are more likely to have a larger share of beds devoted to the provision of long-term care services than SCHs (42 versus 37 percent of beds). Other small rural hospitals serve more Medicare beneficiaries (49 versus 41 percent of cases) than SCHs, but slightly fewer poor elderly (5 versus 7 percent of cases are dual eligible). Small rural hospitals perform similarly to other rural hospitals, and their financial performance under Medicare appeared better than the performance of SCHs in 1989 (see Table 4-5, column 7). However, estimated performance under 1991 rules for SCHs was considerably better than for small rural hospitals.

In order to compare SCHs with rural hospitals with a similar volume of patients, SCHs were compared to rural hospitals with similar average daily census (see Table 4-4, column 8).[6] SCHs tend to have fewer beds designated for long-term care, but are more than twice as likely to provide ICU services. SCHs serve a smaller share of Medicare patients (41 versus 49 percent) although they serve a higher share of poor elderly (7 percent versus 5 percent Medicare-Medicaid dual eligibles). Rural hospitals with similar census perform better under Medicare than other rural hospitals and SCHs (see Table 4-5, column 8). However, under 1991 rules, SCHs have better financial performance than rural hospitals with low volume.

Overall, the characteristics of SCHs do not appear to differ substantially from other rural hospitals in terms of their size and the services they provide. Grandfathered SCHs are more similar to other rural hospitals than to other SCHs, although the differences between all groups are small. The financial performance of SCHs was considerably worse under PPS than other rural hospitals in 1989. However, the overall financial performance of SCHs and other rural hospitals was similar. New SCHs performed considerably better than other groups of SCHs or rural hospitals. The financial performance of SCHs improved considerably under the simulation of 1991 rules, and they appeared to perform better than other rural hospitals.

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[6] Similar average daily census was between 5 and 14 patients. About 36 percent of all SCHs had an ADC in this range.

ARE THERE SUBGROUPS OF RURAL HOSPITALS THAT REQUIRE SPECIAL ASSISTANCE?

Although SCHs on average appear to be performing at least as well as other rural hospitals under PPS under the most recent payment rules, the Commission was concerned that special subgroups of SCHs might not be performing well. One group of special interest are hospitals that are located in especially isolated areas (called frontier hospitals), where the average population density is less than 6 persons per square mile. Currently, there are 193 frontier hospitals that are designated as SCHs, representing over 65 percent of all frontier hospitals. On average, frontier SCHs look very different from other SCHs (see Table 4-4, column 5). Frontier SCHs tend to be located farther from the nearest hospital than other SCHs (45 compared to 38 miles). Frontier SCHs tend to be smaller (28 versus 50 beds), and have lower occupancy rates. Frontier SCHs are as likely to provide emergency room and laboratory services and have more long-term care beds than the average SCH, although they are half as likely to provide intensive care services (29 versus 54 percent). The Medicare share of patients is similar at frontier and other SCHs, although frontier SCHs are slightly less likely to serve the elderly poor (5 versus 7 percent of cases).

Frontier SCHs performed slightly better under PPS than other SCHs, but had slightly worse total margins in 1989 (see Table 4-5, column 5). Current policies appear to have improved frontier performance considerably and they are now faring better than most other SCHs (see Table 4-6, column 5). Frontier SCHs perform better than grandfathered and old SCHs, but worse than new SCHs. Additional targeted assistance to frontier SCHs does not appear to be warranted at this time.

SUMMARY

Congress' concern for ensuring access to care for rural beneficiaries led to the designation of SCHs. These hospitals received additional payments to protect them from insolvency. Between 1983 and 1988, rural hospitals performed worse than urban hospitals, and small rural hospitals and SCHs performed the poorest of any hospital group. This led to the enactment of several policy changes in 1990 and 1991. While SCHs were performing worse than other rural hospitals in 1989, the new policy changes appear to have had the desired effect of improved financial performance for rural hospitals and particularly SCHs. For example, frontier hospitals, which were performing worse than other SCHs in 1989, were especially helped; simulations show that frontier SCHs perform better under current policy than other SCHs.

Hospitals can qualify for SCH status through four criteria: distance, market share, travel time, and weather. Distance, travel time, and weather are all criteria that identify isolated hospitals. As expected, most SCHs are not located near other hospitals; the average SCH is located 38 miles from the nearest hospital. The market share criteria were intended to identify hospitals that, while not meeting the criteria for isolated hospitals, are the sole provider for residents in their market area, and whose closure might result in a significant barrier to access for care of Medicare beneficiaries. Analysis of the market share criteria indicates however, that most SCHs are not the sole providers for beneficiaries in their market area. It also appears that most hospitals meeting the market share criterion do so via certification from the PRO or FI,

rather than having the prerequisite market share. These findings cast doubt on the claim that SCHs are truly the sole providers of service to their market area, and suggest that another look at the eligibility criteria is appropriate. It is possible that these hospitals act as sole providers of care for certain primary care services and emergencies. The Commission may explore using the provision of emergency and primary services in an alternative definition of market share.

The data also indicate no obvious criteria to differentiate SCHs and other rural hospitals. Thus, while the current criteria appear reasonable, a more fundamental look at the relationship between the location of hospitals and beneficiary access to care seems necessary. If the goal of the SCH designation is to protect beneficiary access, it might be more appropriate to fashion eligibility criteria based upon the characteristics of beneficiaries in a specified region. ProPAC supports a reassessment of the criteria to ensure that they reflect the goals of the program. It is also possible that the lack of observed differences between SCHs and other rural hospitals may reflect an incomplete accounting of the heterogeneity of rural areas. Future analyses will examine differences in rural communities that may be confounding these results.

Numerous policy changes have been enacted in the past few years to increase payments to SCHs, and these increased payments have encouraged a number of new eligible hospitals to seek SCH designation. In fact, the number of SCHs increased by 70 percent between 1989 and 1991. An analysis of the characteristics of these new SCHs revealed that they are very similar to other SCHs, except for their financial performance. These new SCHs performed considerably better in 1989 than other SCHs, better than other rural hospitals, and are estimated to be doing extremely well under current rules. Given the tight fiscal constraints facing the Medicare program, additional SCH payments may not be appropriate for all eligible hospitals. Instead, a more targeted insurance mechanism may be needed to protect hospitals that are necessary to maintain access to care. Clarification of the goals of the SCH program and a reexamination of the SCH criteria may be necessary to accomplish this purpose.

Chapter 5

Other Medicare Policy Issues Affecting Rural Hospitals

Analyses presented in this report indicate that policies aimed at improving the performance of rural hospitals, in general, have met their objective. When the impact of current rules was modelled, rural hospitals were estimated to be faring better than urban hospitals in terms of both total and PPS margins. Further, hospital groups targeted by specific policies were found to have the best PPS performance, indicating that these policies were having their intended impact. Based on these findings, the Commission recommends that no further across-the-board payment adjustments be made for rural hospitals until the impacts of current policies, including the elimination of the differential in the standardized amounts, can be assessed.

In addition to financial performance, the Commission examined several issues related to beneficiary access to care. Its analyses indicated that more work needs to be done to identify those hospitals required to maintain access. To improve the criteria, access may need to be defined from the beneficiary perspective. While sole community hospitals (SCHs) as a group do not appear to warrant further protection, there may be subgroups of hospitals that are required for access *and* need additional financial assistance.

The final set of issues considered by the Commission relate to broader issues regarding Medicare policies for rural hospitals. These issues are listed below:

- Medicare's responsibility to underutilized hospitals,
- Encouraging rural beneficiaries to use local hospitals,
- Service and size reconfigurations of rural hospitals,
- Availability of physicians in rural areas, and
- Impact of outpatient and skilled nursing payment reforms on rural hospitals, and

This chapter briefly discusses each of these issues.

MEDICARE'S RESPONSIBILITY TO UNDERUTILIZED HOSPITALS

Examination of sole community hospitals revealed that few SCHs are the sole source of care for Medicare beneficiaries in their area. In addition, despite what appear to be reasonable designation criteria, current policy does not identify a group of hospitals that is distinctly different from other rural hospitals either in terms of services offered or patients treated.

Other work performed for the Commission indicates that rural beneficiaries increasingly travel to urban and rural referral hospitals for surgical and technology-intensive services.[1] To a lesser extent, small rural hospitals treat a declining proportion of their local beneficiaries. These findings suggest that rural beneficiaries often bypass their local hospital in favor of a more sophisticated facility further away. As the practice of medicine becomes more technology-based, it will be increasingly difficult for rural hospitals to offer new services and maintain a viable role in delivering inpatient services to their residents. However, for some groups of beneficiaries, such as the very old or disabled, these hospitals may represent the only source of needed care.

Little is known about the relationship between proximity of hospitals and quality of care and outcomes, both more meaningful measures of access than mileage. The Commission supports further research into the relationship between geographic location of care and outcomes. Hospital closures will impact primary care more than secondary or tertiary care, because many beneficiaries already travel to seek this level of care.

It is not clear what responsibility the Medicare program has in maintaining the current configuration of rural hospital services. Keeping underutilized facilities open at their current levels of operation is expensive for the Medicare program and may not result in high quality of care. Yet using urban hospitals, particularly for relatively simple care, is more expensive both for the program and Medicare beneficiaries and may not improve the quality of care.

The issue of the appropriate size and configuration of the rural health care delivery system permeates all rural hospital payment policies. The Commission recognizes that the problems confronting rural hospitals require difficult decisions by Congress and the Administration regarding the goals of rural health policy. Difficult choices are necessary to achieve the appropriate balance of costs, access, and high quality of care.

ENCOURAGING RURAL BENEFICIARIES TO USE LOCAL HOSPITALS

If one goal of rural health policy is to maintain a role for rural hospitals in delivering inpatient services, Medicare could consider methods to encourage beneficiary use of local hospitals. Local hospital use could be encouraged for services that can safely and effectively be offered at smaller, less sophisticated hospitals. The current use of rural referral and urban hospitals for cases that could be treated at local rural hospitals is more expensive for both the Medicare program and for its beneficiaries. At the same time, because the size of the hospital, and more importantly its volume, may directly affect the quality of care and patient outcomes, particular attention needs to be paid to the service configuration of rural hospitals.

Rural hospitals could also be used for the recuperative phase of care delivered in urban or rural referral hospitals. However, such transfers are discouraged by existing transfer payment policy. Currently, hospitals transferring cases are paid on a per diem basis, with the final hospital receiving the full DRG payment. Until the current disincentives are removed, it is

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[1] Codman Research Group, *Utilization of Inpatient Hospital Services By Rural Medicare Beneficiaries*, ProPAC Technical Report E-90-03, May 1991.

unlikely that such transfers back to the local hospital will occur. More analysis and consideration of possible policy designs are required before such a recommendation can be made.

Restructuring rural hospitals and encouraging participation in networks that could include urban hospitals may, in part, help encourage patient and physician use of rural hospitals. These hospitals would offer only those services they could deliver efficiently and with high quality of care. Transfer arrangements could formally ensure that appropriate services are readily available at another site. If integrated into a system of care that offers the more sophisticated services off-site, physicians may feel less isolated and be encouraged to practice in rural areas. Such efforts at integrating care to ensure a full range of high quality services may encourage rural residents and physicians to use rural hospitals because they could be confident that more elaborate services are available within the network. Policymakers need to explore options to encourage hospital networks that include rural facilities.

In addition to developing incentives for institutions, incentives could be developed for both physicians and beneficiaries. Influencing physician decision-making about where patients are hospitalized may be the most way effective way to change the location of admissions. The feasibility and implications of such a policy for quality of care would need to be thoroughly assessed.

SERVICE AND SIZE RECONFIGURATION

The Commission believes that underutilized hospitals need to evaluate their present role and begin restructuring their services and capacity to more appropriately match the needs of their communities. Analysis of rural hospital utilization (see Appendix E) found that many small and low-volume hospitals use less than a third of their medical/surgical capacity. While many hospitals have expanded into non-acute services, further alternative uses would make better use of existing facilities. The Medicare program should consider options to best achieve the restructuring of these facilities. The Commission supports the concept of the Essential Access Community Hospital (EACH) program, though it has several concerns regarding its specific provisions, as discussed below.

The Essential Access Community Hospital Program

This program was authorized by Congress in the Omnibus Budget Reconciliation Act of 1989 and later funded for the current fiscal year (1991) as a seven-state demonstration project. The goals of the program are to: (1) assure access to care in isolated rural areas by providing emergency services and at least an entry point for inpatient care, and (2) to reduce the cost of providing appropriate care, primarily through downsizing excess inpatient capacity.

The program calls for each state to develop a rural regionalization plan that includes a network of rural primary care hospitals (RPCHs, or "peaches") to provide emergency care and basic inpatient treatment, and essential access community hospitals (EACHs) for referral of more complex cases. The referral hospitals would be existing full service hospitals paid as sole

community providers, while the primary care hospitals would be limited to operating 6 or fewer beds and holding inpatients no longer than 72 hours.

ProPAC strongly endorses the basic concept of regionalization that is promoted by the EACH program. The Commission believes that the dual level of care approach may contribute to assuring access to critical health services, as well as encouraging optimal quality of care, in communities that might otherwise have serious deficiencies in their health care systems. This approach may make more efficient use of scarce health care labor resources in isolated communities, and in doing so may help to contain costs. However, the Commission has several concerns with the design of the program as legislated, particularly when looking ahead to its widespread implementation.

The first concern is the 6-bed size limit for primary care hospitals. Although strongly encouraging the elimination of unused beds, this arbitrary limit risks preventing RPCHs from using existing capacity when needed to treat emergent patients. One impact of this limit, undoubtedly unintended by Congress, may be to encourage many hospitals to continue as full service institutions when it would be more cost-effective for them to convert to RPCHs.

The need for a size limit is most compelling when RPCHs are paid on a cost basis, as current legislation specifies for the first two years of the program. By 1993, a prospective payment method is to be developed, and the Commission would encourage the Health Care Financing Administration to implement prospective payment as quickly as possible. When this has been accomplished, the bed-size limit can safely be eliminated. Moreover, if RPCHs were paid the Federal prospective rate for capital, it would be feasible to eliminate the bed-size limit sooner than 1993. The prospective capital rate would probably more than cover most RPCHs' annual cash requirements for plant and equipment, and these hospitals would be much better able to reduce their operating expenses than their capital expenses in response to short-term volume declines.

The proposed 3-day length of stay limit poses similar problems. While generally promoting inpatient treatment at the appropriate level, this type of constraint is again arbitrary. ProPAC believes there are many diagnoses that frequently require more than a 3-day stay for which patients could receive high quality care at a RPCH. Further, it is likely to result in lower total expenditures than if the patient were stabilized at a primary care hospital followed by transfer to an EACH facility. At the same time, the Commission recognizes the need to limit the types of patients treated in RPCHs, for both quality and cost reasons. One method for accomplishing this that may work better than an across-the-board length of stay cap is a list of approved DRGs or sub-DRG diagnostic categories for RPCHs. The Commission recommends that HCFA research this option in preparing for possible national implementation of the EACH program.

The Commission's third concern is with the proposed minimum standard of 75 beds for EACHs, which is intended as a proxy standard to assure sufficient service capability for treating the bulk of patients that RPCHs would likely transfer to them. The Commission believes that there are a number of hospitals with fewer than 75 beds that do offer an adequate spectrum of services. This minimum might also encourage hospitals to maintain unneeded beds that they might otherwise close. Service capability standards might provide a far more accurate mechanism for screening potential EACHs, and HCFA should investigate this option.

ProPAC anticipates making recommendations of a more technical nature regarding the EACH program in its annual Report and Recommendations to the Congress. In addition, the Commission intends to comment on the proposed regulations for the program when they are published.

The Commission believes, however, that the EACH program is but one example of the kind of approach required to tailor hospital services to meet the needs of the local communities. Many states have developed programs that could serve as models to restructure the delivery system. The Commission plans to examine these state programs for effective models to consider at the national level.

In addition to downsizing and converting capacity, rural hospitals are involved in a variety of activities to restructure their services, increase communication and linkages with other providers, and share staff and other resources. Many of these activities (see Table 5-1) are the same strategies urban hospitals pursue when faced with similar conditions.

Table 5-1. Summary of Hospital Initiatives To Restructure Services

Activity	Description
Networks/telecommunication/etc.	Hospitals linked by telecommunications for diagnostic and treatment consultations, and continuing education.
PPOs Rural HMOs	Increase physician and patient bases by contracting with an HMO or PPO. Hospital Cooperatives Hospitals form cooperatives to share equipment, staff, facilities, administrative services, and staff benefits. The average consortia has 15 members, and over half include a 100+ bed rural hospital and an urban hospital--indicating a formal referral relationship. About 12 percent of rural hospitals are in a cooperative agreement.
Alliances between Primary Care Providers	Primary care providers develop cooperative agreements to jointly recruit, establish computerized information services, and share services noted above.
Multihospital Systems	In addition to the benefits noted under cooperative agreements, multihospital systems (MHSs) can offer immediate financial relief and access to capital. About one third of rural hospitals are in a MHS.
Local Hospital Mergers and Agreements	Hospitals eliminate duplicative services and merge their assets to improve performance. Or, hospitals divide up services to provide, again to improve each hospital's financial position.
Hospital-Physician Agreements	Hospitals and physicians form joint ventures to increase referral base and expand specialty outpatient care. Hospitals offer a variety of incentives for physicians to join.

SOURCE: OTA, *Health Care in Rural* America (Washington, D.C., 1990), Chapter 6.

THE IMPACT OF OTHER POLICIES ON RURAL HOSPITALS

While focusing on inpatient payment policy, the Commission is well aware that rural hospitals are significantly affected by policies directed at other, non-inpatient services. The Commission believes that Medicare's hospital payment policies can not solve the array of problems affecting the delivery of rural health care. As discussed in Appendix D, many problems of rural hospitals extend well beyond hospital payment policy. Policies affecting rural hospitals will increasingly need to reach beyond payment considerations and address such broader issues as: the attraction and retention of physician and other technical personnel,

improvement in the ready access to specialists, the transfer and referral of cases beyond the capability of the local hospital, and the adequate distribution of other non-hospital resources. Some of these issues are discussed below.

Physician Availability

Physician availability may be the single most important factor affecting hospital financial performance and long-term viability. Since 1987, Medicare has offered bonus payments to physicians providing services in manpower shortage areas. However, it is not clear that the additional 10 percent payments provide sufficient incentive to attract or retain physicians.[2] Rural hospitals will also be affected by Medicare's physician payment reform aimed at increasing payments to primary care physicians under the Resource-Based Relative Value Scale. These reforms will be implemented in phases beginning in 1992. This payment reform attempts to level payments between primary care physicians and specialists providing identical services, and to increase payments for evaluative and management services that tend to be provided by primary care physicians. How this reform finally affects the availability of physicians in rural areas remains to be seen.

In addition to Medicare Part B policies, physician availability is influenced by programs aimed at increasing primary care physicians and the number of physicians practicing in rural areas. Scholarship and loan repayment programs with strict service payback provisions and on-going support during the period of service obligation have been the most successful strategies to employ physicians in rural areas, at least in the short-term. Funding cutbacks in these programs may seriously jeopardize the availability of physicians and other health personnel in rural areas. Because rural hospital survival is intimately tied to physician availability, incentives for physicians to locate in rural areas will be key to future hospital success.

Outpatient and Skilled Nursing Facility Payment Reform

The Commission would also like to highlight the importance of the reforms in outpatient and long-term care payment policies for rural hospitals. Rural hospitals are much more dependent on long-term care beds and outpatient services for their revenues than urban hospitals. Further, as care becomes increasingly technology-based, inpatient care in likely to play less of a role in rural hospitals. As Medicare considers payment policy reforms of both outpatient services and skilled nursing care, it will need to pay close attention to how these reforms will affect rural hospitals. Parallel incentives created by Part B payment policies could reinforce the goals of hospital outpatient payment reform.

Limitations of Medicare Payment Policies

Finally, it should be emphasized that many of the problems faced by rural hospitals can not be solved by hospital payment policy or by other Medicare policy reforms. These solutions will require broader solutions beyond the Medicare program's resources and responsibilities.

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[2] Office of Technology Assessment, *Health Care in Rural America*, (Washington, DC: U.S. Government Printing Office, September 1990) p. 350.

Appendix A. Financial Performance of Rural Hospitals, Fiscal Years 1984-1989

INTRODUCTION

The financial performance of hospitals is determined by a number of factors, including the types of services they provide and how they provide them, the ways the hospital is paid for these services, the level of payment, and the broad environment in which the hospital operates. The care provided in rural hospitals is generally less technologically oriented, and less costly, than care provided in urban hospitals. Because of differences in the type of care provided in rural hospitals, and differences in their cost experience (such as lower wages and lower costs per case), rural hospitals have been treated differently under PPS than urban hospitals.

Since it was established, ProPAC has studied the effects of Medicare's prospective payment system on the financial condition of hospitals. The financial performance of all hospitals, as measured by PPS margins or payment to cost ratios, has declined significantly since the implementation of PPS.[1,2] As a group, rural hospitals have performed consistently worse than urban hospitals. However, not all rural hospitals have fared poorly under PPS. One of the purposes of this inquiry is to identify the groups of hospitals that are doing poorly and that are faring well.

This appendix describes the financial performance of rural hospitals under PPS. Costs per case, payments per case, and payment to cost ratios for different groups of rural hospitals over time are examined to understand how PPS has affected the financial viability of rural hospitals. In particular, attention will be placed on whether different groups of hospitals have been able to control the increase in their costs, and whether payments adequately reflect the increase in costs for rural hospitals. Because not all hospitals have fared poorly under PPS, the variation in these measures will be examined to determine whether good performance is concentrated among some groups of rural hospitals.

Rural hospitals have experienced a larger decrease in volume than urban hospitals, and slower growth in case-mix index (CMI) since the inception of PPS. The fourth section is an examination of the relationship between costs per case, payments per case, and payment to cost ratios and changes in volume and case-mix index to determine whether these factors explain differences in financial performance among rural hospitals. Finally, some of the descriptive findings of ProPAC's winners and losers analysis are presented. This section compares and contrasts hospitals that are doing well with hospitals that are doing poorly.

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[1] PPS margin is a measure of hospital profitability that compares PPS payments to Medicare-allowable operating costs.

[2] PPS payment to cost ratio is the ratio of Medicare-allowed costs to PPS payments. This measure provides a directly interpretable assessment of Medicare shortfalls or overpayments in percentage terms.

FINANCIAL PERFORMANCE OF RURAL HOSPITALS UNDER PPS

The PPS operating margin compares PPS payments to Medicare-allowable inpatient operating costs: it excludes capital, indirect medical education, and outpatient costs and revenues. It thus provides a measure of how well the average hospital is paid for the costs that prospective payment is intended to cover.[3] PPS operating margins for all hospitals declined, on average, from 8.4 percent in PPS 1 to -5.9 percent in PPS 6 (see Table A-1). Rural hospitals, which have had consistently lower margins than urban hospitals, have experienced a similar decline in average PPS margin, from 4.7 percent in PPS 1 to -7.0 percent in PPS 6. While the average rural hospital had a negative PPS operating margin in PPS 3, the average urban hospital did not have a negative PPS operating margin until PPS 5.

Table A-1. Mean PPS Margins, by Hospital Group, First Six Years of PPS

Hospital Group	PPS 1	PPS 2	PPS 3	PPS 4	PPS 5	PPS 6
All hospitals	8.4%	8.0%	3.5%	1.1%	-2.6%	-5.9%
Urban	12.3	12.2	7.7	4.7	-0.9	-4.9
Rural	4.7	3.7	-1.2	-2.8	-4.5	-7.0
Frontier	-4.4	-7.5	-4.7	-5.8	-7.9	-10.0
Non-frontier rural	5.9	5.1	-0.8	-2.4	-4.0	-6.7
Sole community	4.5	2.7	-1.4	-3.0	-5.9	-9.8
Rural referral	9.0	12.0	7.1	3.8	1.0	-3.4
Other rural	4.2	2.8	-2.4	-3.7	-4.9	-6.8
Rural <25 beds	-1.9	-4.5	-5.7	-7.1	-5.8	-8.8
Rural 25-49 beds	3.2	2.1	-3.4	-3.9	-5.1	-6.9
Rural 50-99 beds	7.1	6.0	-0.2	-2.1	-4.3	-4.9
Rural 100-149 beds	7.3	5.5	0.8	-1.1	-4.6	-7.5
Rural 150-199 beds	7.8	8.9	3.2	0.5	-1.4	-7.4
Rural 200+ beds	8.5	12.1	6.0	1.8	-1.4	-6.3

Note: Data for each PPS year corresponds to each hospital's cost reporting period beginning in that year. For instance, the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6.

Data are weighted to the hospital level so that the figures reported represent the average hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

There is considerable diversity within rural hospitals. Frontier hospitals have consistently had negative PPS operating margins.[4] Rural referral centers, which receive the higher urban payment rate, have performed consistently better than other rural hospitals; the PPS operating margin for the average rural referral hospital looks more similar to that of the average urban hospital than to other rural hospitals. Sole community hospitals, though paid differently under PPS than other rural hospitals, have a pattern of PPS operating margins similar to other rural

[3] The financial information is weighted by hospital to provide an indication of the performance of the average hospital in a given group. This methodology differs from that used by ProPAC in its annual report on *Medicare and the American Health Care System*, in which data are presented on the flow of payments and costs for the group as a whole, rather than the average for individual hospitals within the group.

[4] Hospitals in areas with population density less than 6 persons per square mile are referred to as frontier hospitals.

hospitals. Finally, size appears to be an important factor in differences in PPS operating margins among rural hospitals. In the early years of PPS, larger hospitals had higher PPS margins. However, in PPS 6, the relationship does not appear to hold as well.

Total hospital revenues and expenses are compared using the measure of total margin.[5] Total margins were lower than PPS margins in the early years of PPS (see Table A-2). Total margins also declined, but they declined much less than PPS margins, and remained well above zero in PPS 6. Although there was some difference in total margins between urban and rural hospitals in the first few years of PPS, that difference has declined substantially. There is a clear relationship between total margins and hospital size; larger hospitals have consistently higher margins, and this relationship holds over time. In all years of PPS, rural referral centers had, on average, the highest total margins of all other rural hospital groupings and urban hospitals as a group. Given the large number of Medicare patients seen by many hospitals, total margins are correlated with PPS margins. Hospitals with high PPS margins are likely to have high total margins, and vice versa. Conversely, hospitals with low PPS margins are likely to have low total margins.

Table A-2. Mean Total Margins, by Hospital Group, First Six Years of PPS

Hospital Group	PPS 1	PPS 2	PPS 3	PPS 4	PPS 5	PPS 6
All hospitals	4.8%	3.9%	2.0%	1.6%	1.9%	2.3%
Urban	6.3	5.3	3.3	2.4	2.3	2.6
Rural	3.4	2.4	0.7	0.8	1.5	2.0
Frontier	1.3	0.5	-0.6	-0.6	-0.2	0.2
Non-frontier rural	3.6	2.7	0.9	1.0	1.6	2.3
Sole community	3.1	2.0	0.3	0.7	1.2	1.3
Rural referral	6.6	7.0	5.3	4.7	5.4	5.7
Other rural	3.0	1.9	0.1	0.3	1.0	1.7
Rural <25 beds	2.3	0.9	-1.2	-0.9	-0.6	0.4
Rural 25-49 beds	2.1	1.1	-0.8	-0.5	-0.3	0.8
Rural 50-99 beds	3.8	2.4	0.7	1.1	1.6	2.1
Rural 100-149 beds	4.7	4.4	2.8	2.6	3.2	3.9
Rural 150-199 beds	5.3	5.3	3.8	3.3	4.1	5.0
Rural 200+ beds	6.7	6.9	5.1	4.5	5.7	5.3

Note: Data for each PPS year corresponds to each hospital's cost reporting period beginning in that year. For instance, the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6.

Data are weighted to the hospital level so that the figures reported represent the average hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

Another measure of hospital financial performance is the PPS payment to cost ratio, which is the ratio of PPS payments to Medicare-allowed costs. A payment to cost ratio of 1.0 means that PPS payments exactly cover Medicare-allowed costs; while a payment to cost ratio greater than 1.0 means that payments are in excess of Medicare-allowed costs; and, a payment to cost ratio less than 1.0 means that payments do not cover all Medicare-allowed costs.

[5] Total margins compare total hospital revenues and expenses for all inpatient, outpatient, and non-patient care activities for all payers.

Payment to cost ratios provide a direct assessment of Medicare shortfalls or overpayments in percentage terms.

On average, all hospitals received PPS payments that were in excess of Medicare-allowed costs from PPS 1 through PPS 5, and PPS payments that were less than Medicare-allowed costs in PPS 6 (see Table A-3). These overpayments ranged from 12 percent in PPS 1 to 4 percent in PPS 5. However, rural hospitals as a group had lower payment to cost ratios than urban hospitals, and received payments that were less than Medicare-allowed costs in PPS 5 and PPS 6. These underpayments ranged from 1 to 5 percent. As with PPS margins, there is considerable variation across hospital groups. Frontier hospitals had consistently lower payment to cost ratios than other rural hospitals; in PPS 6, their Medicare shortfall equaled 4 percent. Rural referrals centers had payment to cost ratios that more closely resemble those of urban hospitals than other rural hospitals. Smaller hospitals had payment to cost ratios that were consistently lower than larger hospitals until PPS 5, when the Medicare shortfalls for all sizes of hospitals were similar.

Table A-3. PPS Payment to Cost Ratios, by Hospital Group, First Six Years of PPS

Hospital Group	PPS 1	PPS 2	PPS 3	PPS 4	PPS 5	PPS 6
All hospitals	1.12	1.12	1.06	1.04	1.00	0.97
Urban	1.17	1.16	1.10	1.07	1.02	0.98
Rural	1.08	1.07	1.01	1.00	0.99	0.97
Frontier	1.01	1.00	0.99	0.99	0.97	0.96
Non-frontier rural	1.09	1.08	1.01	1.00	0.99	0.97
Sole community	1.06	1.06	1.01	1.00	0.98	0.95
Rural referral	1.11	1.15	1.09	1.05	1.03	0.98
Other rural	1.07	1.06	1.00	0.99	0.99	0.97
Rural <25 beds	1.04	1.02	0.98	0.97	0.99	0.97
Rural 25-49 beds	1.07	1.06	0.99	1.00	0.99	0.98
Rural 50-99 beds	1.09	1.08	1.02	1.00	0.98	0.97
Rural 100-149 beds	1.09	1.08	1.02	1.00	0.98	0.95
Rural 150-199 beds	1.09	1.11	1.05	1.03	1.01	0.95
Rural 200+ beds	1.10	1.15	1.08	1.03	1.00	0.96

Note: Data for each PPS year corresponds to each hospital's cost reporting period beginning in that year. For instance, the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6.

Data are weighted to the hospital level so that the figures reported represent the average hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

PPS payment to cost ratios increased the first year of PPS, but decreased each year thereafter (see Table A-4). For all hospitals, the decrease in payment to cost ratio was 12.4 percent between PPS 1 and PPS 6. Hospitals that began with lower payment to cost ratios, such as frontier hospitals and small hospitals, experienced less of a decline than other hospitals. The net effect of changes was that PPS payment to cost ratios looked more similar across hospital groups in PPS 6 than in PPS 1.

Table A-4. Percent Change in PPS Payment to Cost Ratios, by Hospital Group

Hospital Group	TEFRA-PPS 1	PPS 1-2	PPS 2-3	PPS 3-4	PPS 4-5	PPS 5-6	PPS 1-6
All hospitals	13.2%	0.0%	-5.8%	-2.1%	-2.6%	-2.8%	-12.4%
Urban	16.9	0.4	-5.6	-3.0	-4.4	-3.8	-15.1
Rural	9.6	-0.4	-5.9	-1.1	-0.7	-1.7	-9.7
Frontier	6.4	-1.1	-4.0	1.4	0.6	-0.2	-6.2
Non-frontier rural	10.0	-0.3	-6.1	-1.3	-0.8	-1.9	-10.1
Sole community	9.8	-0.9	-4.8	-0.8	-1.5	-2.4	-11.3
Rural referral	10.4	4.0	-4.8	-3.0	-2.4	-3.8	-10.4
Other rural	9.5	-0.8	-6.4	-0.8	-0.2	-1.2	-9.1
Rural <25 beds	8.7	-1.8	-4.5	-0.2	2.2	-2.2	-7.9
Rural 25-49 beds	9.1	-0.4	-6.4	-0.1	0.3	-0.7	-7.5
Rural 50-99 beds	10.5	-0.5	-6.4	-1.6	-1.3	-1.2	-10.6
Rural 100-149 beds	9.8	-1.2	-5.2	-1.2	-2.4	-2.2	-12.5
Rural 150-199 beds	8.6	1.7	-5.2	-3.2	-1.9	-5.1	-12.6
Rural 200+ beds	10.6	4.4	-6.1	-3.8	-3.0	-4.2	-12.8

Note: Data for each PPS year corresponds to each hospital's cost reporting period beginning in that year. For instance, the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6.

Data are weighted to the hospital level so that the figures reported represent the average hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

One of the major objectives of PPS payment policy was to encourage hospitals to hold down the costs of providing services to Medicare patients. The relatively poor performance of some groups of hospitals under PPS may reflect their inability to contain costs. PPS costs per case in rural hospitals are considerably less than in urban hospitals--the cost per case in the average rural hospital is about 60 percent of the cost per case in the average urban hospital (see Table A-5). This difference has been increasing slowly since the beginning of PPS. Within rural hospitals, PPS costs per case are higher at sole community and rural referral hospitals, and in larger hospitals. PPS costs per case have increased in both urban and rural hospitals (see Table A-6). Because rural hospital costs per case have risen more slowly, the difference between rural and urban hospitals is growing over time. PPS costs per case have increased more rapidly in rural referral centers and larger hospitals, where costs per case were higher to begin with.

Table A-5. Mean PPS Costs Per Case, by Hospital Group, First Six Years of PPS

Hospital Group	PPS 1	PPS 2	PPS 3	PPS 4	PPS 5	PPS 6
All hospitals	$2,547	$2,815	$3,089	$3,336	$3,661	$3,984
Urban	3,166	3,514	3,817	4,147	4,566	4,982
Rural	1,940	2,101	2,270	2,443	2,675	2,881
Frontier	2,015	2,199	2,164	2,332	2,556	2,745
Non-frontier rural	1,929	2,087	2,282	2,456	2,689	2,897
Sole community	2,082	2,230	2,343	2,523	2,754	3,001
Rural referral	2,328	2,552	2,799	3,073	3,398	3,740
Other rural	1,850	2,002	2,170	2,326	2,540	2,713
Rural <25 beds	1,839	2,081	2,145	2,265	2,442	2,627
Rural 25-49 beds	1,811	1,934	2,083	2,248	2,474	2,603
Rural 50-99 beds	1,940	2,096	2,270	2,423	2,648	2,846
Rural 100-149 beds	2,183	2,328	2,500	2,725	2,969	3,261
Rural 150-199 beds	2,141	2,333	2,564	2,805	3,039	3,362
Rural 200+ beds	2,347	2,554	2,840	3,113	3,450	3,836

Note: Data for each PPS year corresponds to each hospital's cost reporting beginning in that year. For instance the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6.

Data are weighted to the hospital level so that the figures reported represent the average hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

Table A-6. Mean Change in PPS Operating Costs Per Case, by Hospital Group

Hospital Group	TEFRA-PPS 1	PPS 1-2	PPS 2-3	PPS 3-4	PPS 4-5	PPS 5-6	PPS 1-6
All hospitals	3.0%	10.7%	10.3%	9.3%	11.2%	9.7%	56.1%
Urban	2.3	10.9	10.6	9.6	11.6	10.7	60.3
Rural	3.8	10.4	9.9	8.9	10.8	8.7	52.1
Frontier	12.4	11.9	7.9	9.0	12.8	7.4	48.5
Non-frontier rural	2.7	10.2	10.2	8.9	10.6	8.9	52.5
Sole community	5.8	10.1	8.7	8.7	11.7	10.1	53.2
Rural referral	1.7	9.6	10.3	10.4	11.1	10.6	60.6
Other rural	3.5	10.6	10.3	8.7	10.5	8.0	50.5
Rural <25 beds	5.5	14.6	8.4	9.3	10.3	9.5	52.7
Rural 25-49 beds	5.5	10.5	10.5	9.6	11.6	7.0	50.5
Rural 50-99 beds	1.7	9.8	9.9	7.6	10.4	8.6	49.8
Rural 100-149 beds	3.7	8.6	9.3	8.6	10.2	10.5	54.8
Rural 150-199 beds	3.0	8.9	10.3	10.1	9.9	10.9	57.6
Rural 200+ beds	1.6	9.0	10.9	10.4	11.5	11.6	62.8

Note: Data for each PPS year corresponds to each hospital's cost reporting beginning in that year. For instance the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6.

Data are weighted to the hospital level so that the figures reported represent the typical hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

VARIATION IN FINANCIAL PERFORMANCE WITHIN RURAL HOSPITALS

As a group, rural hospitals performed poorly under PPS through 1989 compared to urban hospitals. Rural referral centers and small hospitals performed the least well. However, even within hospital groups, there is considerable variation in performance under PPS. In PPS 6, when the median PPS margin was -3.3 percent, over 42 percent of hospitals had PPS margins that were positive. Even among frontier hospitals, which had the lowest average PPS margin of all rural hospital groups, almost 42 percent had positive PPS margins (see Tables A-7 and A-8). Twenty-five percent of hospitals had PPS margins that were at least 7 percent and total margins that were at least 7 percent. An interesting finding is the relationship between variation and hospital size; larger hospitals appear to show less variation in PPS and total margins. These patterns of variation are characteristic of PPS 1 through PPS 5, as well.

Table A-7. Variation in PPS Margins 1989, by Hospital Group

	Percentile				
Hospital Group	10th	25th	Median	75th	90th
All hospitals	-29.5%	-15.3%	-3.3%	7.0%	15.4%
Urban	-26.0	-13.8	-2.9	7.2	15.3
Rural	-33.3	-16.9	-3.9	6.9	15.7
Frontier	-49.1	-21.4	-4.2	8.3	18.2
Non-frontier rural	-31.3	-16.3	-3.8	6.8	15.2
Sole community	-38.9	-19.9	-5.9	5.4	14.3
Rural referral	-20.6	-11.3	-3.0	5.8	13.0
Other rural	-33.5	-17.2	-3.2	7.8	16.4
Rural <25 beds	-52.4	-20.3	-2.5	0.9	22.3
Rural 25-49 beds	-38.9	-19.2	-1.9	9.5	18.5
Rural 50-99 beds	-29.3	-16.2	-4.3	5.8	14.3
Rural 100-149 beds	-31.1	-16.5	-4.6	5.4	11.8
Rural 150-199 beds	-29.7	-12.6	-4.4	3.4	11.1
Rural 200+ beds	-22.5	-14.1	-5.2	1.8	9.9

Note: Data for each PPS year corresponds to each hospital's cost reporting period beginning in that year. For instance, the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6.

Data are weighted to the hospital level so that the figures reported represent the average hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

Table A-8. Variation in Total Margins in 1989, by Hospital Group

Hospital Group	Percentile				
	10th	25th	Median	75th	90th
All hospitals	-7.2%	-1.1%	3.0%	6.8%	10.5%
Urban	-6.6	-0.3	3.3	6.9	10.4
Rural	-8.0	-1.9	2.5	6.8	10.6
Frontier	-13.0	-5.5	0.7	6.3	10.7
Non-frontier rural	-7.1	-1.5	2.7	6.9	10.6
Sole community	-9.3	-3.1	1.9	6.4	10.5
Rural referral	0.4	2.5	5.4	8.6	12.9
Other rural	-8.6	-2.5	2.1	6.6	10.3
Rural <25 beds	-12.5	-5.8	1.3	6.7	10.4
Rural 25-49 beds	-10.4	-3.9	1.4	6.3	10.2
Rural 50-99 beds	-7.0	-1.8	2.3	6.6	10.6
Rural 100-149 beds	-4.1	1.2	3.8	7.6	10.8
Rural 150-199 beds	-2.9	0.8	4.7	8.9	14.1
Rural 200+ beds	0.5	2.5	5.0	7.8	10.6

Note: Data for each PPS year corresponds to each hospital's cost reporting period beginning in that year. For instance, the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6.

Data are weighted to the hospital level so that the figures reported represent the average hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

There is considerable variation in PPS costs per case (see Table A-9). Although the PPS costs per case for the average rural hospital are only 60 percent of the PPS costs per case for the average urban hospital, more than 25 percent of rural hospitals have costs higher than the average urban hospital. The variation in PPS costs per case does not appear related to hospital size or other characteristics that affect PPS costs per case. When one examines the cumulative change in PPS costs per case, a different pattern emerges. The variation in the change in PPS costs per case is greater for rural hospitals than urban (see Table A-10). The variation is also greater than average for sole community hospitals, frontier hospitals, and small hospitals -- hospitals that have lost the most volume during this period.

Table A-9. Variation in PPS Costs Per Case in 1989, by Hospital Group

Hospital Group	Percentile				
	10th	25th	Median	75th	90th
All hospitals	$2,169	$2,760	$3,748	$4,957	$6,136
Urban	3,362	4,026	4,813	5,738	6,779
Rural	1,926	2,264	2,773	3,344	3,969
Frontier	1,790	2,075	2,567	2,154	4,059
Non-frontier rural	1,946	2,281	2,801	3,357	3,970
Sole community	2,007	2,361	2,868	3,442	4,095
Rural referral	2,898	3,241	3,625	4,093	4,715
Other rural	1,850	2,175	2,628	3,116	3,001
Rural <25 beds	1,734	2,008	2,403	3,039	3,740
Rural 25-49 beds	1,746	2,073	2,470	3,012	3,581
Rural 50-99 beds	1,975	2,304	2,727	3,229	3,847
Rural 100-149 beds	2,425	2,790	3,150	3,631	4,234
Rural 150-199 beds	2,542	2,904	3,211	3,703	4,341
Rural 200+ beds	2,952	3,395	3,709	4,184	4,922

Note: Data for each PPS year corresponds to each hospital's cost reporting period beginning in that year. For instance, the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6.

Data are weighted to the hospital level so that the figures reported represent the average hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

Table A-10. Variation in the Change in PPS Costs Per Case, PPS 1-6, by Hospital Group

Hospital Group	Percentile				
	10th	25th	Median	75th	90th
All hospitals	19.2%	34.3%	52.9%	73.0%	94.9%
Urban	27.0	41.4	57.2	75.1	94.8
Rural	12.6	28.3	48.1	69.9	95.1
Frontier	0.2	21.5	43.1	75.1	103.3
Non-frontier rural	14.3	29.1	48.4	69.7	94.9
Sole community	8.0	25.3	46.9	73.2	105.0
Rural referral	29.2	41.9	57.5	74.3	95.5
Other rural	11.8	26.9	46.5	68.0	93.0
Rural <25 beds	8.1	22.4	43.7	79.2	111.2
Rural 25-49 beds	4.9	23.8	44.8	69.7	102.2
Rural 50-99 beds	15.1	27.9	45.7	65.8	87.8
Rural 100-149 beds	21.5	35.5	51.4	70.9	89.8
Rural 150-199 beds	24.4	39.3	53.6	72.9	92.1
Rural 200+ beds	32.2	44.9	60.0	79.9	100.6

Note: Data for each PPS year corresponds to each hospital's cost reporting period beginning in that year. For instance, the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6.

Data are weighted to the hospital level so that the figures reported represent the average hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

FINANCIAL PERFORMANCE AND CHANGES IN VOLUME AND CASE-MIX INDEX

Changes in a hospital's volume and case-mix index will affect the level of payment to that hospital. PPS reimburses hospitals for the average cost of a patient: if volume declines cause the hospital's fixed costs to be spread over a smaller number of cases, the payments to the hospital may not cover costs. The relationship between volume and financial performance was discussed more fully in Chapter 3. The hospital's case-mix index directly affects both the hospital's costs and payment levels.

While the volume of patients has declined for all hospitals, rural hospitals have faced a much greater decline in their patient population. The number of Medicare patients discharged decreased consistently for all hospitals until PPS 4. Between the first year of PPS and PPS 6, the average hospital experienced a cumulative 9.8 percent decline in Medicare discharges. However, this decline was not evenly distributed between urban and rural hospitals (see Table A-11). Urban hospitals averaged a 5.6 percent decrease in Medicare discharges, and rural hospital discharges decreased an average of 13.8 percent. Rural referral centers experienced less of a decrease in Medicare discharges than other rural hospitals. Larger hospitals were better able to retain patients than smaller hospitals. It is important to note that the decline in volume was not only due to a decline in utilization for Medicare patients, but was actually greater for non-Medicare patients (see Table A-12).

Table A-11. Percent Change in Medicare Discharges, by Hospital Group

Hospital Group	TEFRA-PPS 1	PPS 1-2	PPS 2-3	PPS 3-4	PPS 4-5	PPS 5-6	PPS 1-6
All hospitals	-7.4%	-6.4%	-4.8%	-2.2%	1.1%	1.6%	-9.8%
Urban	-6.1	-5.1	-3.4	-1.3	1.4	1.2	-5.6
Rural	-8.7	-7.6	-6.2	-3.1	0.9	2.1	-13.8
Frontier	-14.4	-3.8	-5.3	-2.3	-1.9	4.4	-7.6
Non-frontier rural	-8.0	-8.1	-6.3	-3.2	1.2	1.8	-14.6
Sole community	-8.8	-3.4	-5.5	-2.3	0.2	2.0	-10.0
Rural referral	-5.8	-5.6	-3.2	0.6	2.0	2.6	-3.5
Other rural	-9.1	-9.1	-6.9	-4.0	1.0	2.0	-16.5
Rural <25 beds	-10.8	-9.5	-9.8	-3.7	1.0	0.4	-21.1
Rural 25-49 beds	-10.7	-7.9	-7.2	-4.8	-0.5	2.9	-16.0
Rural 50-99 beds	-7.6	-8.6	-5.6	-2.9	1.0	2.0	-15.6
Rural 100-149 beds	-5.9	-4.3	-4.1	-1.3	3.3	2.1	-5.4
Rural 150-199 beds	-7.6	-5.8	-4.7	-0.9	0.2	1.4	-6.9
Rural 200+ beds	-5.8	-5.2	-2.9	-0.4	3.2	1.2	-3.4

Note: Data for each PPS year corresponds to each hospital's cost reporting period beginning in that year. For instance, the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6.

Data are weighted to the hospital level so that the figures reported represent the average hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

Table A-12. Percent Change in Total Discharges, by Hospital Group

Hospital Group	TEFRA-PPS 1	PPS 1-2	PPS 2-3	PPS 3-4	PPS 4-5	PPS 5-6	PPS 1-6
All hospitals	-3.9%	-4.9%	-4.0%	-2.7%	-0.1%	0.4%	-13.8%
Urban	-1.1	-2.8	-2.6	-1.8	1.7	0.9	-6.7
Rural	-6.8	-7.1	-5.5	-3.6	-2.0	-0.1	-20.2
Frontier	-15.3	-9.2	-6.1	-4.1	-2.4	-1.1	-25.3
Non-frontier rural	-6.0	-6.8	-5.4	-3.5	-2.0	-0.0	-19.6
Sole community	-2.7	-5.2	-5.0	-3.9	-1.4	-3.1	-20.1
Rural referral	-6.9	-7.9	-0.4	-1.2	1.1	0.4	-8.4
Other rural	-7.7	-6.8	-6.4	-3.9	-2.7	0.7	-22.1
Rural <25 beds	-5.4	-9.3	-7.5	-6.6	-1.4	-2.5	-27.4
Rural 25-49 beds	-9.7	-9.3	-6.7	-3.8	-4.3	-1.5	-25.1
Rural 50-99 beds	-7.3	-7.3	-5.4	-4.1	-1.7	2.0	-20.5
Rural 100-149 beds	-1.2	-2.9	-3.4	-3.0	0.8	0.4	-9.6
Rural 150-199 beds	-7.2	-3.8	-1.3	0.7	-1.1	-2.0	-13.6
Rural 200+ beds	-4.8	0.2	-4.5	-0.9	0.5	0.2	-9.2

Note: Data for each PPS year corresponds to each hospital's cost reporting period beginning in that year. For instance, the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6. Data are weighted to the hospital level so that the figures reported represent the average hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

There is a relationship between changes in volume and payment to cost ratios. For all hospital groupings, an increase in volume was associated with a more positive change in payment to cost ratios than a decrease in volume (see Tables A-13 and A-14). Between PPS 5 and PPS 6, rural hospitals that were in the top quartile of change in total volume (e.g., they had the greatest positive change in total discharges) had a 2.2 percent increase in total payment to cost ratios (see Table A-13). Rural hospitals in the lowest quartile of volume change (e.g., they had the greatest decline in total discharges) experienced a 1.1 percent decrease in total payment to cost ratios.

A similar relationship exists when the change in Medicare discharges is compared with the change in PPS payment to cost ratios (see Table A-14). Rural hospitals that were in the highest quartile of change in Medicare volume (e.g., they had the greatest positive change in Medicare discharges) experienced a 2.3 percent increase in Medicare payment to cost ratios. Rural hospitals that were in the lowest quartile of change in Medicare volume (e.g., they had the greatest negative change in Medicare discharges) experienced a 5.3 percent decrease in Medicare payment to cost ratios. These relationships hold for urban hospitals and within subgroups of rural hospitals as well.

Table A-13. Relationship Between Change in Total Payment to Cost Ratios and Change in All Discharges, PPS 5-6

Hospital Group	Change in Total Discharges, by Quartile			
	1 (Bottom)	2	3	4 (Top)
All hospitals	-0.8%	0.0%	0.8%	1.6%
Urban	-0.4	-0.5	-0.9	1.1
Rural	-1.1	0.2	1.1	2.2
Frontier	-2.5	-1.8	-0.6	5.3
Non-frontier rural	-0.9	0.4	1.2	1.8
Sole community	-1.5	-0.7	1.1	-0.7
Rural referral	0.4	0.6	1.2	2.1
Other rural	-1.1	0.4	1.2	1.8
Rural <25 beds	-1.8	-0.3	-2.0	3.8
Rural 25-49 beds	-1.5	0.5	-0.6	2.6
Rural 50-99 beds	-1.6	-0.7	-0.9	0.6
Rural 100-149 beds	2.2	-1.5	0.3	1.0
Rural 150-199 beds	-1.8	-1.4	1.8	0.9
Rural 200+ beds	0.6	-0.7	0.1	1.6

Note: Data for each PPS year corresponds to each hospital's cost reporting beginning in that year. For instance the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6. Data are weighted to the hospital level so that the figures reported represent the average hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

Table A-14. Relationships Between Change in Medicare Payment to Cost Ratios and Change in Medicare Discharges, PPS 5-6

Hospital Group	Change in Medicare Discharges, by Quartile			
	1 (Bottom)	2	3	4 (Top)
All hospitals	-5.0%	-3.7%	-2.5%	0.0%
Urban	-4.9	-3.8	-3.8	-2.8
Rural	-5.3	-2.6	-1.3	2.3
Frontier	-3.3	-0.3	0.0	3.2
Non-frontier rural	-5.6	-2.8	1.4	2.2
Sole community	-5.1	-2.7	-1.7	0.6
Rural referral	-6.0	-4.3	-3.0	-2.8
Other rural	-5.3	-2.2	-0.7	-3.3
Rural <25 beds	-7.0	-3.7	-0.6	3.5
Rural 25-49 beds	-6.0	-1.4	0.7	3.5
Rural 50-99 beds	-4.3	-1.9	-0.8	1.9
Rural 100-149 beds	-2.0	-3.6	-2.6	0.9
Rural 150-199 beds	-8.3	-5.3	-3.6	-4.8
Rural 200+ beds	-4.8	-3.9	-5.1	-1.5

Note: Data for each PPS year corresponds to each hospital's cost reporting beginning in that year. For instance the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6. Data are weighted to the hospital level so that the figures reported represent the average hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

The case-mix index, the average DRG weight for all cases paid under PPS, measures the relative costliness of the patients treated in a given hospital. The case-mix index increased each year since the implementation of PPS (see Table A-15). The increase was greater in urban hospitals than rural hospitals; the case-mix index increased 15.6 percent in urban hospitals since the implementation of PPS, and only 8.4 percent in rural hospitals. Among rural hospitals, the case mix increase was greater in rural referral centers and larger hospitals.

Table A-15. Percent Change in Case-Mix Index, by Hospital Group

Hospital Group	PPS 1-2	PPS 2-3	PPS 3-4	PPS 4-5	PPS 5-6	PPS 1-6
All hospitals	3.2%	2.1%	1.9%	2.5%	2.1%	11.9%
Urban	3.9	2.7	2.3	3.5	2.5	15.6
Rural	2.4	1.4	1.4	1.5	1.6	8.4
Frontier	2.1	0.3	0.8	-0.2	2.2	4.7
Non-frontier rural	2.5	1.5	1.5	1.7	1.5	8.8
Sole community	2.3	0.7	1.9	1.0	1.7	7.3
Rural referral	4.0	2.7	2.5	3.1	2.2	15.0
Other rural	2.2	1.4	1.2	1.4	1.5	7.7
Rural <25 beds	1.9	0.8	0.5	0.2	1.2	4.0
Rural 25-49 beds	1.9	0.8	1.2	0.6	1.4	6.0
Rural 50-99 beds	2.5	1.5	1.5	1.7	1.6	8.8
Rural 100-149 beds	3.1	2.3	2.0	3.0	1.7	12.8
Rural 150-199 beds	3.2	2.1	2.1	2.7	1.8	12.0
Rural 200+ beds	4.0	2.5	2.3	3.2	2.3	14.9

Note: Data for each PPS year corresponds to each hospital's cost reporting period beginning in that year. For instance, the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6.

Data are weighted to the hospital level so that the figures reported represent the average hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

Surprisingly, there does not appear to be a clear relationship between changes in case-mix index and financial performance, as measured by payment to cost ratios (see Table A-16). The relationship seems to hold in broad hospital groups. For example, rural hospitals in the lowest quartile of case-mix index change (e.g., they had the greatest negative change in case-mix index) had a 2.1 percent decrease in payment to cost ratio between PPS 5 and PPS 6. Rural hospitals in the highest quartile of case-mix index change (e.g., they had the greatest positive change in case-mix index) had a smaller (0.6 percent) decrease in payment to cost ratios. However, when the relationship between change in case-mix index and change in financial performance is examined for hospital groupings within rural, such as rural referral centers, there is no apparent relationship. This finding suggests that case-mix index change corresponds closely to changes in resource use and costs, and that these costs are being accurately reflected in payment levels.

Table A-16. Relationships Between Change in Medicare Payment to Cost Ratios and Change in Case-Mix Index PPS 5-6

Hospital Group	Change in Medicare Case-Mix Index, by Quartile			
	1 (Bottom)	2	3	4 (Top)
All hospitals				
Urban	-5.1%	-4.6%	-3.4%	-2.1%
Rural	-2.1	-2.7	-1.4	-0.6
Frontier	-1.3	2.3	-3.9	1.1
Non-frontier rural	-2.2	-3.2	-1.2	-0.9
Sole community	-2.9	-2.7	-2.8	-1.1
Rural referral	-3.5	-5.5	-2.2	-3.6
Other rural	-1.8	-2.1	-0.8	0.0
Rural <25 beds	-4.0	-0.3	-2.2	-1.3
Rural 25-49 beds	-0.7	-1.6	-1.2	-0.3
Rural 50-99 beds	-2.9	-2.2	-0.4	0.6
Rural 100-149 beds	-1.7	-4.7	-0.6	-2.0
Rural 150-199 beds	-5.8	-4.5	-5.5	-5.3
Rural 200+ beds	-2.2	-6.1	-3.1	-3.6

Note: Data for each PPS year corresponds to each hospital's cost reporting beginning in that year. For instance the PPS 1 year includes data from each hospital's cost report beginning during the first year of PPS (fiscal year 1984). Excludes hospitals in Maryland and Puerto Rico; includes hospitals in Massachusetts and New York beginning with PPS 3; and includes hospitals in New Jersey beginning with PPS 6.

Data are weighted to the hospital level so that the figures reported represent the typical hospital within that group.

SOURCE: ProPAC analysis of Medicare Cost Report data from the Health Care Financing Administration.

RURAL HOSPITALS WITH CONSISTENTLY HIGH OR LOW PPS MARGINS

Even as the performance of PPS rural hospitals declines in aggregate, some rural hospitals continue to perform well under PPS, as illustrated in the previous section. As the aggregate PPS margin falls, there is interest in determining why some rural hospitals had financial success under PPS and others had profound financial losses under PPS. To the extent that these reasons are beyond the hospital's control, changes in the payment system may be indicated. If they are related to the hospital's behavior, it may be possible to use such behavior as a model for other hospitals in similar situations.

This section presents information on rural hospitals with consistently high PPS margins (called winners), those with consistently low PPS margins (called losers), and all other hospitals. Consistent performance is defined as a PPS margin in the top or bottom quartile of the distribution of the PPS margins of all rural hospitals in the third, fourth, and fifth years of PPS.

The performance of rural hospitals under PPS worsened and became less predictable with time. The decline in performance was greater for hospitals with the lowest margins than for hospitals with the highest overall margins. In fact, the PPS margins of rural hospital winners remained almost unchanged in the third, fourth and fifth years of PPS. By contrast, the performance of the PPS losers deteriorated each year (see Table A-17).

Table A-17. Characteristics of Rural Hospitals With Consistently Low & Consistently High PPS Margins

	Losers	Middle	Winners
1986 PPS margin	-23.4%	0.8%	18.0%
1987 PPS margin	-28.6	-1.1	17.9
1988 PPS margin	-33.4	-2.6	17.6
Percent rural referral	0.9%	12.5%	23.9%
Distribution by size:			
Rural <50 beds	60.1%	42.7%	53.0%
Rural 50-99 beds	26.2	34.3	22.3
Rural 100-169 beds	10.1	15.1	12.9
Rural 170 + beds	3.2	7.9	11.9
Percent accredited	48.2%	60.0%	64.9%
Percent outreach services	28.4%	36.0%	37.6%
Percent alternative services	43.1%	53.6%	65.4%
Percent technical services	58.7%	69.7%	65.8%
Wage index	0.80	0.80	0.79
CMI - Referral	1.23	1.22	1.26
Other	1.05	1.07	1.04
Labor productivity	11.1	12.7	14.3
Skill mix	49.5%	47.6%	44.9%
Percent change in admissions (1984-1988)	-29.6%	-22.1%	-14.4%
Percent change in LOS (1984-1988)	7.8%	0.0%	-1.4%

Note: Winners and losers are defined as having PPS margins in the top and bottom quartile of the distribution of all PPS margins in PPS 3, PPS 4, and PPS 5.

SOURCE: ProPAC analysis of Medicare Cost Report data and American Hospital Association Annual Survey.

Ownership

The likelihood of being a PPS winner or loser appeared to vary with ownership. Public hospitals were more likely to be PPS losers and less likely to be PPS winners. Although they were not more likely to be PPS winners, for-profit hospitals were much less likely to be PPS losers. Conversely, church-owned hospitals were more likely to be PPS winners but they had about the same proportion of PPS losers as would be expected given their proportion in the population.

Location

Location also appeared to be associated with differences in performance. The proportion of winners was slightly higher in the Mountain Region, and North Central Regions, although, no region appeared to have a disproportionate share of these hospitals. The proportion of PPS losers was higher in the South Atlantic Region, and West South Central Region.

Special Hospital Designation

Referral hospitals were about 13 times less likely to be PPS losers and about 1.8 times more likely to be PPS winners than their proportion in the industry would indicate. This is not surprising because rural referral hospitals receive higher payments under PPS. Sole community hospitals also receive some special consideration under PPS. However, these hospitals are slightly more likely to be PPS losers, even though there are sole community hospitals that are PPS winners.

Characteristics such as region, ownership, and PPS payment status are usually not within the control of the hospital. However, it is likely that they appear to differ between winning and losing hospitals only because they are proxies for certain other factors. For example, the region of the country could represent practice patterns. Hospitals with different types of ownership may have responded to PPS in varying ways, some of which were more successful than others. Rural referral hospitals may be more successful because they benefit from economies of scale due to the size of those institutions.

Size

The smallest hospitals have the most disparate performances. These hospitals dominate the consistently low PPS category, representing 60 percent of all PPS losers. Simultaneously, small hospitals are also slightly more likely to be PPS winners than their proportion in the industry would indicate. Thus, while many small hospitals perform poorly under PPS, there are other small hospitals that manage to have considerable financial success. The performance of the largest hospitals appears to be more consistent. These hospitals appear to be less likely to be PPS losers and more likely to be PPS winners than other rural hospitals. After rural referral status is accounted for, however, the size of winning and losing hospitals is very similar. In general, there are two groups of rural hospitals that are more likely to be winners under PPS -- the 170 bed and over hospitals and the under 50 bed hospitals.

Service Mix

Rural PPS losers were less likely to offer outreach services such as occupational medicine, outpatient and rehabilitation services. They also were less likely to have alternative services or units such as home care services, a hospice or a separate nursing home facility. These hospitals were also less likely to have a swing-bed unit. Although there is no direct measure of the quality of the services that hospitals offer, the losing rural hospitals were less likely to be JCAHO accredited than other hospitals. Thus, the winning hospitals offered more services that were possibly of a higher quality to earn additional income, to attract more patients or physicians, or to use their assets more efficiently.

The relationship between financial success for rural hospitals and services does not extend to offering more expensive, technical services. For example, winning hospitals are not more likely to offer technical services such as magnetic resonance imaging (MRI), lithotripters, cardiac catheterization labs, intensive care units (ICUs), and open heart surgery capability than other rural hospitals.

Labor Costs

Rural hospitals with the best financial performance under PPS do not have higher values of the HCFA Wage Index. These hospitals do, however, have lower wages than other hospitals in their state. Because PPS pays one rate for all rural hospitals in the state, there are clear benefits to controlling labor costs. Winning hospitals also have a lower percent of staff that is administrative, use less expensive types of personnel, and have higher labor productivity than other hospitals. Further, the relationship between performance and productivity was quite strong.

Case-Mix Index

Winning hospitals did not have higher CMIs than other hospitals in 1988. It is commonly believed that successful hospitals under PPS have increased their CMI, in part through improved medical record documentation and coding. But the CMIs of winning hospitals generally did not appear to have increased at a faster rate than other hospitals.

Transfer Cases

Other work by ProPAC has found that the costs of transfer cases, either in or out of the reference hospital, generally exceed payments. Hospitals tend to lose money on transfer-out cases because the per diem payment is based on average costs per day, yet costs are generally incurred in the first days of the hospitalization. Transfer-in cases tend to be losers because they are more likely to be outlier cases. However, the number of transfers-in or -out, appears to be unrelated to PPS financial status. Rural referral winners had roughly the same proportion of transfers-in or -out as other rural referral hospitals. Non-referral winners have roughly the same proportion of transfer-in cases but did appear to transfer-out fewer Medicare cases than similar hospitals.

Average Length of Stay

The rural hospitals that were winners started out with roughly the same average length-of-stay as other rural hospitals in 1984. Because PPS is a per-case system, hospitals that were successful under PPS were expected to have decreased their length of stay relative to other hospitals. As expected, they decreased their length-of-stay -- both absolutely and relative to the other hospitals. Because winning hospitals offer alternative services more than other hospitals, it was probably easier for them to reduce their length-of-stay.

Outlier Cases

Winning hospitals also had a lower percentage of outliers than other hospitals. This may have been a by-product of their reduction in length-of-stay and higher use of alternative services.

Mix of Nursing Staff

The mix of nursing staff was considered inappropriate when compared to the value of their product prior to PPS. Because PPS encouraged efficiency, hospitals would have responded to PPS by substituting registered nurses (RNs) for licensed practical nurses (LPNs). From 1984 to 1988, hospitals increased by about 14 percent the share of their nursing staff attributable to RNs. This study hypothesized that financially successful hospitals may have been more likely to recognize the efficiency gains from substituting RNs for LPNs. This did not appear to be true as the substitution was found to be relatively constant across differences in financial performance.

Volume

The average winning rural hospital would be expected to have more admissions and a higher occupancy rate than other hospitals. This appeared to be partially true. Winning referral hospitals did not have a greater number of admissions or higher occupancy rates than other hospitals. In contrast, non-referral losers had fewer admissions and lower occupancy rates than other hospitals. An important factor that appeared to differ between winners and losers was the smaller decline in the number of inpatient admissions over the period 1984 and 1988 of winning hospitals. As a result, winning hospitals tended to gain more in their market share than losing hospitals. Winning hospitals also had slightly less variability in their year to year change in admissions.

A possible significant influence in maintaining admission volume is that rural hospitals that were winners were located in communities with more physicians per capita. Surprisingly, these hospitals were not located in areas with more population or higher population growth. Further, the PPS winners tended to be located in areas with lower per capita income and higher rates of the elderly poor. This may occur because wage rates tend to be lower in these areas and PPS pays based on the state average rural wage rather than the local wage rate. Moreover, poor people tend to be sicker and more disabled, which would increase inpatient utilization. Last, PPS payments for DSHs may also benefit those hospitals.

Winning Strategies

Winners are hospitals that reduced their length of stay, controlled labor costs in relation to others in their state, slowed the rate of decline in admissions and offered the appropriate services for their market area. Although large referral centers were much less likely to be PPS losers, size alone does not guarantee or prohibit financial performance under PPS. The important factors are generally within the hospital's control, suggesting that hospitals can influence their own performance under PPS, at least to some extent, through good management.

CONCLUSIONS

The financial performance of hospitals has declined significantly since the implementation of PPS through PPS 6. Although rural hospitals as a group performed consistently worse than urban hospitals between PPS 1 and PPS 5, there is considerable variation within rural hospitals. Rural referral centers performed better on measures of financial performance than other rural hospitals: their performance was more similar to urban hospitals than other rural hospitals. Frontier hospitals and small hospitals performed consistently worse than other hospital groups.

Although some groups of hospitals performed consistently worse than other hospitals under PPS, even within these groups there is considerable variation in performance. In 1989, when the median PPS margin was -3.3 percent, 42 percent of hospitals had PPS margins that were positive. Even among frontier hospitals, which had the lowest average PPS margins of any hospital group, 42 percent had positive PPS margins. In fact, 25 percent of frontier hospitals had PPS margins greater than 8.3 percent in 1989.

Rural hospitals faced a significant decline in patient volume, both for Medicare and non-Medicare patients. There is a strong relationship between changes in volume and payment to cost ratios. This finding is especially significant for small rural hospitals, which had the greatest decreases in volume of all hospital groups. The relationship between changes in volume and financial performance is discussed more fully in Chapter 3. There does not appear to be a relationship between changes in case-mix index and payment to cost ratios.

When the characteristics of winners and losers were compared, several factors differentiated these hospitals. Winners reduced their length of stay and slowed the rate of decline in admissions more than losers. Although large referral centers were more likely to be winners, size alone does not guarantee or prohibit favorable financial performance.

Appendix B. Modeling Fiscal Year 1991 Policy: Methods, Assumptions, and Limitations

The analysis presented in Chapter 2 of this report estimates changes in PPS payments and hospital financial performance that would have occurred if alternative fiscal year 1991 payment policies had been in effect during PPS 1 and PPS 6. This analysis required PPS payment estimates for four different scenarios:

- If all fiscal year 1991 payment policies had been in effect in PPS 1;
- If selected individual fiscal year 1991 policies had been in effect in PPS 1;
- If all fiscal year 1991 payment policies had been in effect in PPS 6, and;
- If fiscal year 1991 policies had been in effect in PPS 6 and the differential between the standardized payment amounts for hospitals located in rural and other urban areas had been eliminated.

These estimates were also used to calculate the PPS and total margins hospitals would have experienced in PPS 1 and PPS 6 if all fiscal year 1991 policies had been in place.

These estimates were produced by modifying ProPAC's PPS payment model to reflect each scenario of interest. Then, each model was applied to data for the relevant PPS year. This Appendix briefly describes the ProPAC payment model and the specific methods and assumptions the Commission used to develop estimates for each policy scenario. The limitations of these estimates are also summarized.

THE PROPAC PPS PAYMENT MODEL

To evaluate payment policy options under PPS, ProPAC frequently makes estimates of hypothetical PPS payments that would be made under alternative policies. These estimates are generated by the ProPAC payment model under specified assumptions.

The payment model is a series of computational routines representing PPS payment policy in each Federal fiscal year from 1984 to 1992. These routines use hospital-specific information together with the rules and parameters of PPS policy to calculate estimated PPS operating payments for each PPS hospital in each fiscal year.

The hospital-specific data include all of the information necessary to determine each hospital's payments under PPS. This includes, for each Federal fiscal year, its geographic location (in a large urban, other urban or rural area, and its MSA or state), its payment status (as a referral center, sole community, or small rural Medicare dependent hospital), and the extent to which it engages in teaching activity and service to low-income patients (its ratio of interns and residents per bed, and its disproportionate share patient percentage).

The policy parameters and rules reflect the PPS policies in effect in each fiscal year. Parameters include information such as the standardized payment amounts, the wage index, the

DRG relative weights, the outlier thresholds, and the teaching and disproportionate share adjustment percentages in effect each year. The rules describe the actual method of calculating payments for each type of payment in each fiscal year. That is, the model includes the applicable rules for calculating the components of PPS payments, such as basic DRG payments, payments for transfers and outlier cases, and additional payments for teaching and disproportionate share hospitals (DSHs), for each type of hospital for each fiscal year.

To calculate estimated payments for all hospitals in a particular fiscal year, the policy parameters and payment rules for that year are applied to the hospital-specific data in two modules. In the first module, the relevant rules and payment parameters are applied to all of the bills reported by each hospital in the MedPAR file for the fiscal year. This module calculates a case-mix index, and transfer and outlier payments for each hospital. This hospital-level information is then transferred to the second module where all of the components of PPS payments are calculated and added together for each hospital.

The hospital-specific data are drawn from the Pricer file and the MedPAR file for each fiscal year, provided by the Health Care Financing Administration (HCFA). The applicable rules and parameters are obtained from the final rule published for each fiscal year in the *Federal Register.*

Limitations of the Estimated Payments

While the rules, parameters and data used in the model are generally quite accurate, the payment estimates generated by the model are not a completely accurate representation of actual payments to each hospital in each fiscal year. Estimated payments to hospitals differ from actual payments for several reasons. First, the policy rules and parameters used in the model are the rules and parameters in effect on the last day of each Federal fiscal year. Since the policy rules and parameters have often changed during the year due to legislation, payments estimated by the model do not fully reflect the actual flow of PPS payments to each hospital during each year.

Second, the model assumes that each hospital entered PPS at the beginning of the first PPS year (October 1, 1983), and that all hospitals have a common reporting period that corresponds to the Federal fiscal year. However, hospitals actually entered PPS according to the beginning dates of their cost reporting periods that are spread out over Federal fiscal year 1984. In addition, most hospitals were paid according to overall PPS payment rates that changed twice during each of the first four years of PPS -- once at the beginning of the Federal fiscal year, and once at the beginning of each hospital's reporting period. The model makes these adjustments only once, at the beginning of the year. These assumptions probably have relatively little effect on estimates of aggregate PPS payments after fiscal year 1984. However, they may have some impact on the estimate for a group of hospitals that have a distribution of reporting periods that differs from distribution for all hospitals.

Another problem is that payments cannot be estimated for all hospitals in each fiscal year. Hospitals in Maryland, New Jersey, New York, Massachusetts and Puerto Rico were excluded from PPS for the first few years. Hospitals in New York and Massachusetts entered PPS during fiscal year 1986, while hospitals in Puerto Rico and New Jersey entered PPS in fiscal

year 1987 and fiscal year 1989, respectively. In addition, key data are sometimes unavailable for some hospitals in some years. Consequently, some comparisons of estimated payments over time are potentially confounded with changes in the population of hospitals included in the model.

These limitations may affect the comparability of estimated payments over time, or across hospital groups. However, ProPAC has devoted some effort to assessing the impact of these limitations, and to finding methods of comparison that avoid or minimize their effects. For example, comparisons of payments per case between years are often made using the cohort of hospitals included in PPS in both years. Thus, in general, the Commission is confident that the estimates produced by the model fairly represent trends in PPS payments over time and payment patterns among groups of hospitals.

Estimating PPS and Total Margins

The financial performance of hospitals under PPS and overall are measured by PPS operating margins and total margins. PPS operating margins show the relationship between a hospital's total payments under PPS and its Medicare inpatient operating costs.[1] Thus, PPS margins indicate how payments compare to the costs they were intended to cover. Total margins show the relationship between total revenues and total costs for the hospital as a whole, including all of its activities both related and unrelated to patient care, inpatient and outpatient care, and non-Medicare payers. The information necessary to calculate margins is drawn from the Medicare cost reports (MCRs) that hospitals file annually with HCFA.

As noted above, the PPS payments generated by the model may be used to estimate what hospitals' PPS and total margins would have been under different sets of PPS policies. This is accomplished in three steps. In the first step, the PPS payment model is used to estimate payments, in a particular fiscal year, under two sets of policies. That is, payments for a particular year (e.g., fiscal year 1989) are estimated under the actual PPS policies in effect at the close of that year, and under any alternative set of policies of interest in the analysis (e.g., changes in the wage index). Then, these estimates are used to calculate the percentage change in PPS payments that the alternative policies would have produced relative to the actual (base) policy.

In the second step, the estimated percentage change in payments for each hospital is used to adjust the PPS payments it reported on its cost report for the corresponding PPS year. Thus, if the policy of interest is modelled in fiscal year 1989 (PPS 6), the estimated change in PPS payments for that year would be applied to the PPS payments each hospital reported during that year.

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[1] The PPS operating margin is defined as PPS revenues minus PPS operating costs, divided by PPS revenues. This measure excludes Medicare inpatient costs and payments related to components of costs that have been paid, historically, outside of PPS (such as capital costs and direct costs of direct medical education and training programs). Costs and revenues unrelated to the provision of inpatient care to Medicare beneficiaries (e.g., treatment of other patients, or activities unrelated to patient care) are also excluded.

In the third step, the adjusted payments from the hospital's cost report are used along with reported inpatient operating costs to recalculate its PPS margin. Similarly, the hospital's total revenues are adjusted to reflect the estimated change in PPS payments. Then the adjusted total revenue information is combined with reported total costs to recalculate the hospital's total margin.

Limitations of Estimated Financial Performance

In general, the estimates of changes in hospital financial performance are subject to the same limitations as the underlying payment estimates, plus several additional limitations. Since the time periods of the model and the MCR data do not match, the volume of Medicare cases included in each source (the MedPAR data and the MCR data) may differ. In this event, estimated aggregate PPS payments from the payment model would not match reported PPS payments from the MCR. To avoid this potential distortion, the estimated percentage change in payments is applied to payments per discharge from the MCR. The assumption underlying this approach, however, is that the change in policy being modeled would have had the same percentage effect on PPS payments throughout hospitals' cost reporting periods as it had in the Federal fiscal year.

A second limitation of the margin estimates is that MCR data are not available for all hospitals. Thus, margin estimates cannot be made for all hospitals in each PPS year. Although the potential bias in the estimates is probably quite small for most years for most hospital groups, the estimates may not be fully comparable from one year to another, or among hospital groups within a year.

It is also important to note that margin estimates depend on hospital costs and resource use, while the payment estimates are essentially independent of hospital cost behavior (except for potential changes in case-mix or volume of discharges that might have occurred in response to the policy changes being modeled). The margin estimates assume that hospitals would not have changed their behavior, at least in so far as it affects their costs, in response to the alternative policies of interest. Therefore, the margin estimates should be considered as estimates of what would have happened to hospital financial performance before hospitals had the opportunity to change their behavior in any significant way. Obviously, the extent to which hospitals would have changed their behavior, and the length of time required to do so, could influence these estimates. This assumption should be considered when reviewing the results of analyses based on these estimates.

MODELING THE POLICY SCENARIOS

The general methods described above were used to estimate changes in PPS payments and hospital margins that would have occurred under each policy scenario. Each set of estimates, however, required separate modifications of the general approach. These modifications are described below for each policy scenario.

Modeling Fiscal Year 1991 Policy in PPS 1

This model estimates what PPS payments, PPS margins, and total margins would have been in PPS 1 under fiscal year 1991 policy. Payments were estimated under fiscal year 1991 policy and under fiscal year 1984 policy, using the relevant policy rules and parameters applicable in each year, with appropriate data for fiscal year 1984 and PPS 1.

The case-mix indexes were based on the DRG grouper and relative weights actually in use for fiscal year 1984. No attempt was made to estimate how changes in the DRG classification rules and changes in the DRG weights would have affected payments to hospitals if they had been applied in fiscal year 1984.

As explained in Chapter 2, the fiscal year 1991 model was estimated in fiscal year 1984 under three alternative assumptions:

- **Fully Implemented**--Fiscal year 1991 policy was applied to 100 percent of payments. This assumes PPS policy was fully implemented in PPS 1, without the transition policy or the budget neutrality requirement that existed in fiscal year 1984. This model shows the full impact that fiscal year 1991 policy could have had in PPS 1.

- **With Transition**--Fiscal year 1991 policy was applied to 25 percent of payments, while the remaining 75 percent of payments was based on the hospital-specific payment amounts that actually applied in fiscal year 1984. This estimate is not budget neutral; aggregate payments to all hospitals were allowed to increase above actual aggregate PPS payments in PPS 1.

- **Budget Neutral with Transition**--This model incorporates both the transition policy and the budget neutrality requirements that actually existed in fiscal year 1984. Fiscal year 1991 policy was applied to 25 percent of payments, and total payments were held to what was actually paid in PPS 1. These payment estimates most closely approximate the likely effects of fiscal year 1991 policy in PPS 1.

Estimated payments from these models were compared to estimated payments under the fiscal year 1984 payment model applied to actual fiscal year 1984 data. In addition, PPS margins and total margins were estimated by applying the estimated change in payments for each hospital to the total PPS payments it reported in its PPS 1 cost report.

Several specific features of fiscal year 1991 policy had to be adjusted to what they might have looked like in fiscal year 1984. This required a number of adjustments.

Standardized Payment Amounts--Under fiscal year 1991 policy, hospitals are paid on the basis of three different standardized payment amounts, reflecting their location in a large urban, other urban or rural area. In fiscal year 1984, however, there were only two standardized amounts (urban and rural). In addition, the standardized amounts for fiscal year 1991 incorporate the annual updates that have been applied over the years, as well as other policy

changes, such as the change in the financing of outlier payments, and the change from hospital to discharge weighting in the calculation of these amounts. To approximate what the fiscal year 1991 standardized amounts would have looked like in fiscal year 1984, the fiscal year 1991 standardized amounts were deflated by the average cumulative update between fiscal year 1984 and fiscal year 1991. This put the fiscal year 1991 standardized amounts in fiscal year 1984 dollars.

The Fiscal Year 1991 Wage Index--The HCFA wage index used in fiscal year 1991 differs from the actual wage index used in fiscal year 1984 in several ways: it is based on HCFA survey data for 1988, rather than Bureau of Labor Statistics unemployment insurance data for 1981; it accounts for differences in the use of part-time and full-time workers across areas; it includes fringe benefits and home office costs as well as wages and salaries; and it reflects the impact of the policy of redesignating certain rural hospitals as urban hospitals. To create a wage index that reflects fiscal year 1991 policy, but is based on data that might have been available in fiscal year 1984, the HCFA wage index for fiscal year 1986 was modified to represent fiscal year 1991 policy.

The fiscal year 1986 wage index is based on HCFA wage survey data from 1982, and it reflects differential use of part-time and full-time labor across areas. This wage index was adjusted to reflect the impact of fringe benefits and allocated home office costs, and redesignation of rural hospitals. This adjustment was made by computing the percentage difference for each labor market area (LMA) between the actual fiscal year 1991 wage index, and an index based on the same 1988 data but excluding fringe benefits and home office costs, and ignoring the rural hospital redesignation. The estimated percentage difference for each labor market was applied to the fiscal year 1986 wage index to yield an fiscal year 1991 policy wage index for fiscal year 1984. This assumes that the percentage difference due to these policy differences would have been the same in each LMA in the 1982 data as it was in the 1988 data.

Outlier Payments--The outlier policy in fiscal year 1991 reflects major revisions, adopted in fiscal year 1989, that substantially changed the distribution of outlier payments among hospitals. In addition, the outlier thresholds actually used in fiscal year 1984 were based on 1981 data, which preceded marked behavioral changes of 1983 and 1984. As a result, the outlier thresholds were set too high, and actual outlier payments to hospitals during the first two years of PPS were substantially below the expected amounts. Similar underpayments would have occurred, however, if fiscal year 1991 outlier policy had been implemented in fiscal year 1984, because data for a period later than 1981 would not have been available. The goal was to obtain a reasonable approximation of the outlier payments that would have been made under fiscal year 1991 policy in fiscal year 1984. This was accomplished by adjusting the estimated distribution of outlier payments in fiscal year 1991 (based on fiscal year 1989 MedPAR data) so that aggregate outlier payments as a percentage of total DRG payments remained the same as it actually was in fiscal year 1984. Under this method, estimated outlier payments reflect the distribution of payments under fiscal year 1991 policy, but the level of payments under fiscal year 1984 policy.

Rural Referral Centers, Sole Community Hospitals, Small Rural Medicare-Dependent Hospitals, and Rural Redesignated Hospitals--Between fiscal year 1984 and fiscal year 1991, the number of hospitals qualifying for these designations increased greatly. In addition, the payment rules for these categories of hospitals also changed. To model fiscal year 1991 policy in fiscal

year 1984, hospitals with these designations in fiscal year 1991 were assumed to have been designated in fiscal year 1984. Estimated payments to these hospitals were also modeled, as closely as possible, under the policies in use in fiscal year 1991. This proved to be misleading in the case of sole community and Medicare-dependent hospitals, however, because one of the payment options they receive under current policy could not have been available in fiscal year 1984. The option of being paid on the basis of the hospital's 1987 base year costs, could not have been used in fiscal year 1984. This does not mean that the estimates of the change in payments that these hospitals would have received if fiscal year 1991 policies had applied in PPS 1 are understated. Instead, the fact that one of the payment options could not have been available means that these groups of hospitals could not have benefitted from current policies back in fiscal year 1984.

Disproportionate Share and Indirect Medical Education Adjustments--Fiscal year 1991 policy includes additional payments to hospitals serving a disproportionate share of low-income patients. This policy was adopted in fiscal year 1986 and subsequently modified a number of times in the years since then. The disproportionate share patient percentage (the percentage of total patient days provided to Medicaid patients plus the percentage of Medicare patient days accounted for by Medicare beneficiaries who are also eligible for Supplemental Security Income benefits) was computed for each hospital based on fiscal year 1984 data. These percentages were used along with the disproportionate share payment rules and parameters of fiscal year 1991 policy to estimate additional payments to DSHs in fiscal year 1984. Similar changes were made to reflect differences in the fiscal year 1984 and fiscal year 1991 policies regarding additional payments to hospitals for the indirect cost of operating graduate medical education programs.

Modeling Individual Fiscal Year 1991 Policies in PPS 1

The payment effects that individual fiscal year 1991 policies would have had if they had been applied in fiscal year 1984 were estimated by similar methods. In this instance, however, the fiscal year 1984 payment model was modified to include only the specific fiscal year 1991 policy of interest. All of the estimates of the effects of individual policies were made using the fully-implemented version of the model, because the focus in this part of the analysis was on the full effects of each individual policy change.

Modeling Fiscal Year 1991 Policy in PPS 6

As described in Chapter 2, the Commission also examined changes in payments and margins that would have occurred if fiscal year 1991 policy had been in effect in PPS 6. This analysis assesses the likely effects of current policy on the most recent cost and discharge data. In addition, it assesses the relative impact of policy changes compared with the consequences of changes in hospital circumstances, such as the large declines in the volume of Medicare discharges experienced by many hospitals between fiscal year 1984 and fiscal year 1989.

To make these estimates, a variety of adjustments were required. For example, the 1991 standardized amounts had to be deflated to fiscal year 1989, to put them in fiscal year 1989 dollars. Similarly, the fiscal year 1989 wage index was adjusted to reflect differences in policy between fiscal year 1989 and fiscal year 1991. Again, the most recent wage data that could have

been available in fiscal year 1989 (1984 data) were used for this purpose. These data were adjusted by similar methods to reflect the addition of fringe benefits and home office costs to the calculation of the index.

Once these adjustments were made, the fiscal year 1991 model was run on the modified fiscal year 1989 data. These estimates were compared with estimated payments from the fiscal year 1989 model applied to the actual fiscal year 1989 data. Then, estimates of PPS and total margins were calculated by applying the estimated percentage change in PPS payments for each hospital to its actual PPS payments reported on its PPS 6 cost report.

Modeling the Elimination of the Rural/Other Urban Differential

Current law requires that the differential in the standardized payment amounts between rural and other urban hospitals be eliminated by fiscal year 1995, through higher updates for rural hospitals. This analysis estimates what the impact of this elimination would have been had it been implemented in fiscal year 1989.

Estimates of PPS payments after elimination of the differential were obtained by applying the fiscal year 1991 model to the fiscal year 1989 data, but using the other urban deflated fiscal year 1991 standardized payment amounts in place of the deflated rural standardized amounts. This model differed from the earlier model of fiscal year 1991 policy in two ways. First, the actual fiscal year 1991 wage index was used in this model. Second, these estimates were held budget neutral. That is, estimated aggregate payments based on this model were adjusted to match estimated aggregate payments under a comparable model of fiscal year 1991 policy in fiscal year 1989 that included the differential in the standardized amounts.

Estimates of changes in payments under fiscal year 1991 policy without the differential were then calculated. This was done by comparing the payments estimated in the model without the differential to payments estimated in the model with the differential. Finally, these estimates were used to calculate estimates of the PPS margins that hospitals would have experienced in PPS 6 if fiscal year 1991 policy without the differential had been implemented in fiscal year 1989.

Appendix C. Relationship Between Volume and Costs and Payments

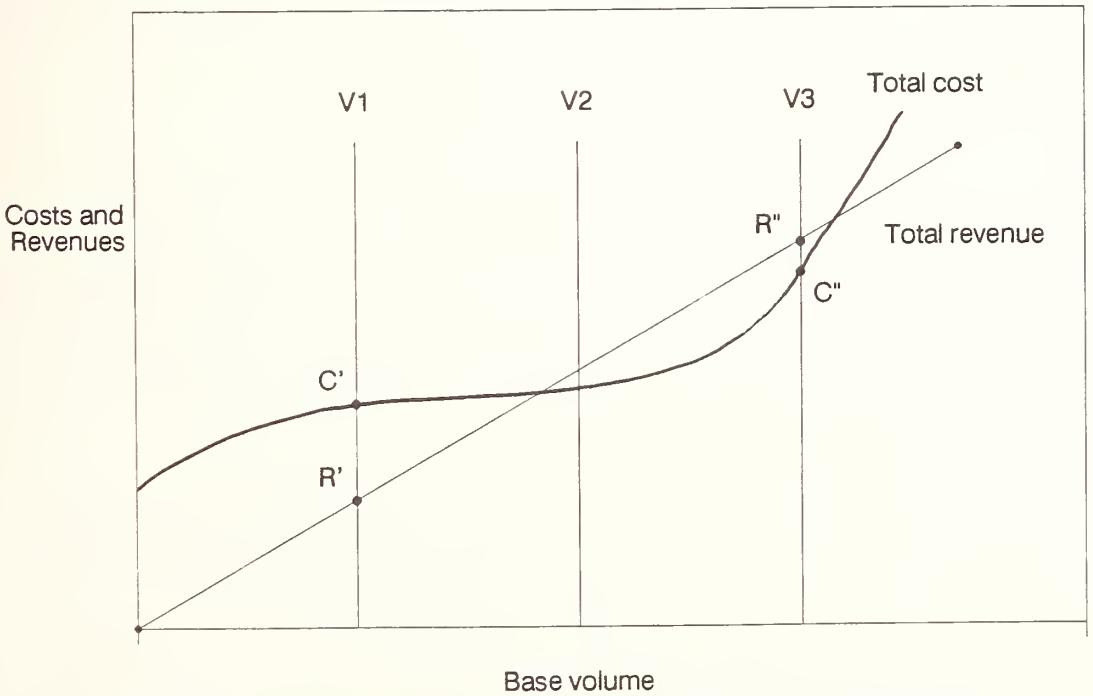
The general relationship between patient volume, costs and revenues, a hospital cost function and revenue curves are illustrated in Figure C-1. It shows how total facility costs can vary directly but not proportionately with volume, while revenues increase proportionately with volume.

The total cost function is a curved line due to the presence of fixed and variable costs that vary as a proportion of total costs as volume changes. The slope of this line represents the marginal cost at any given level of volume. The total revenue "curve" is a straight line, since under a fixed per case payment system payments go up and down proportionally with patient volume. The average payment rate is represented by the slope of this line and is constant.

When volume declines, say from level V2 to V1, hospitals are likely to have revenues (R') less than costs (C'). In the short run they will experience payment shortfalls, while in the long run hospital management will have incentives to adjust resource levels to treat smaller numbers of patients. Large volume declines will cause the largest difference between payments and costs and, therefore, the worst margins.

In contrast, hospitals with volume increases are in a good financial situation. For example, if volume increases from V2 to V3, revenues (R") exceed costs (C") and the hospital will realize profits. This is because until volume increases exceed the point where the cost curve crosses the revenue line, increases in variable costs will not exceed increases in payments. The hospital will incur the variable costs for the extra patients from level V2 to V3, but not additional fixed costs. Yet, it will receive enough payments to cover both fixed and variable costs for those additional patients.

Figure C- 1. Relationship Between Volume and Costs and Payments



SOURCE: Abt Associates Inc., "Volume Adjustments Used in State Medicaid Programs and Rate-Setting Systems," under contract to ProPAC, Contract No. T-75963392, May 1991, Figure 1.

Appendix D. Patterns of Rural Health Care Delivery

This appendix provides some background information on the changing patterns of rural health care delivery. It begins with a discussion of the rural population in general, focusing on the changing demographics and highlighting differences between rural and urban populations. The rural health care delivery system, including hospitals, hospital outpatient and other diagnostic services, and subacute services such as skilled nursing and home health services, are discussed next. It concludes with a brief review of health manpower issues.

CHANGES IN RURAL DEMOGRAPHICS

The proportion of the U.S. population residing in rural areas is declining. In 1950, 36 percent of the population lived in rural areas, compared with 27 percent in 1988. The decrease is not due to a decline in absolute numbers of people, but rather to slower rates of growth. In the 1980s, the population in rural areas increased an average of 0.6 percent per year, as compared to an average increase of over 1.0 percent per year in urban areas.[1] Rural residents are more highly concentrated in the South and Midwest, where about 30 percent of the population lives in rural areas, and least concentrated in the Northwest, where only 12 percent of the population resides in a rural area.

There are significant differences in the characteristics of people living in rural and urban areas. A larger proportion of residents in rural areas are older: 13.0 percent of residents in rural areas are 65 years of age and older, compared to only 10.7 percent in urban areas. Income is generally lower in rural areas; the median family income in rural areas was $24,397 in 1988, compared to $33,131 in urban areas. Unemployment rates are also higher in rural areas (8.4 percent unemployment compared to 6.9 percent in urban areas). Higher levels of unemployment and lower income levels in rural areas are associated with a higher proportion of persons without health insurance. In 1987, 17.4 percent of rural residents had no health insurance, compared to less than 15 percent of urban residents.[2] The larger proportion of elderly persons means that providers in rural areas are likely to have a higher proportion of Medicare beneficiaries.

Health Status

In addition to significant demographic differences between rural and urban residents, there are significant differences in mortality and health status. After adjusting for age, sex, and race, rural residents have lower overall mortality than urban residents, 8.9 deaths per 1,000 rural residents compared to 9.2 per 1,000 urban residents. While rural residents have comparable or lower mortality rates than urban residents for most leading causes of death, such as heart disease, cancer, and chronic obstructive pulmonary disease, the mortality rate for accidents and motor vehicle accidents is significantly higher for rural residents than urban residents.

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[1] Office of Technology Assessment (OTA), *Health Care in Rural America*, (Washington, DC: U.S. Government Printing Office, 1990), page 38.

[2] Ibid., p.43.

Rural residents have generally poorer health status than urban residents. A smaller proportion of rural residents rate their health as excellent or good (64.3 percent compared to 69.0 percent for urban residents). Several chronic diseases are much more prevalent among rural residents than urban residents (see Table D-1). While the frequency of acute illness is similar among urban and rural residents (see Table D-2), the number of restricted activity days due to illness is higher among rural residents.

Table D-1. Selected Chronic Conditions Among Rural and Urban Residents, 1987 (Prevalence Per 1000 Persons)

Condition	Urban	Rural
Heart disease	77.4	99.3
Hypertension	113.6	135.7
Chronic bronchitis	51.8	59.2
Emphysema	8.1	10.2
Arthritis	123.8	158.9
Diabetes	26.6	31.7
Anemia	13.7	12.2
Visual impairment	31.9	38.9
Hearing impairment	82.0	108.5
Speech impairment	9.8	10.9

SOURCE: Current estimates from the National Health Interview Survey: United States, 1987.

Table D-2. Selected Acute Conditions Among Urban and Rural Residents, 1986 (Prevalence Per 1000 Persons)

	Rural			Urban		
	Prevalence Per 1000 Persons	Restricted Activity Days	Bed Days	Prevalence Per 1000 Persons	Restricted Activity Days	Bed Days
All acute	173.0	707.3	295.4	172.6	671.9	298.2
Respiratory	80.2	265.8	136.5	80.0	263.9	131.0
Digestive system	5.3	31.1	12.0	6.6	11.0	5.4
Urinary	4.0	13.9	5.1	2.3	11.0	5.4
Ear/eye	11.1	20.4	7.7	10.7	25.5	11.0
Injuries	24.9	180.2	56.8	27.6	158.6	52.4

SOURCE: Current estimates from the National Health Interview Survey: United States, 1987

Hospitals

Over the past ten years, all hospitals have experienced significant changes in the financing and delivery of care. Several concurrent trends should be noted. Utilization declined over 11 percent, falling faster for the under 65 population. In fact, despite a substantial drop in admissions between 1984 and 1986, Medicare admissions increased over 13 percent between 1979 and 1989. Partially explaining this increase in utilization was the steady growth in the number of elderly and the continued aging of the population.

In response to the general decline in admissions, the number of hospital beds decreased, although at a slower rate. As a result, occupancy rates declined from an average of 74 percent in 1979 to 66 percent in 1989, with smaller and more isolated hospitals having the lowest occupancy rates. At the same time, the utilization of outpatient services increased. A variety of

measures, including the proportion of surgery done on an outpatient basis, the number of outpatient surgeries, the number of outpatient departments, and the proportion of total revenues generated by the outpatient services all attest to this shift.[3] This shift reflects the confluence of the following factors: the technology allowing this shift to occur, payment incentives to shift services from inpatient to outpatient settings, and changes in consumer demand and physician practice patterns.

The trends discussed above are even more pronounced in rural hospitals. In addition, rural economies are declining and, when combined with the poorer health status and higher proportions of uninsured in rural areas, have resulted in deteriorating financial conditions for these hospitals. Poor economies also make it very difficult for communities to attract and keep a physician base necessary to generate sufficient admissions to ensure hospital financial viability. Manpower shortages for various personnel represent a serious concern for rural hospitals. Further, without adequate admissions, it is increasingly hard for rural hospitals to justify and maintain the technology necessary to continue to attract admissions. Work conducted for ProPAC has shown that Medicare beneficiaries increasingly travel to urban areas for their more technology-based and surgical care. Appendix E discusses the characteristics and service offerings of rural hospitals in more detail.

All of these factors combine to create a difficult environment for many rural hospitals to remain viable. Appendix A presents the financial performance of rural hospitals between 1984 and 1989 in more detail.

Hospital Outpatient and Other Diagnostic Services

Like all hospitals, rural facilities have shifted a large part of their business to the outpatient department. Small hospitals (under 50 beds and mostly rural) have experienced larger increases in outpatient visits. Between 1984 and 1989, visits increased 41 percent in small hospitals, compared with 16 percent for large facilities. Similarly, smaller hospitals are more reliant than larger facilities on outpatient revenues. In small hospitals outpatient revenues are 32 percent of total revenues, but make up only 17 percent for hospitals with over 500 beds.

This larger component of outpatient business is the result of several factors. First, rural hospitals have had a larger decline in inpatient activity, thereby increasing the proportion of revenues that are outpatient-related. As inpatient services becoming more sophisticated, they become more out of reach for many rural hospitals. Therefore, as discussed elsewhere in this report, rural beneficiaries increasingly travel to urban and rural referral hospitals for many, especially technology-based, services. As medical and technical advances make outpatient treatment increasingly common, rural hospitals cannot make up for lost inpatient volume by developing more sophisticated, technology-intensive inpatient services.

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[3] Between 1979 and 1989, inpatient surgeries declined by 30 percent while outpatient surgery increased by 304 percent. The number of hospitals with outpatient departments increased from 49 percent in 1979 to 81 percent in 1989, contributing to growth in the number of visits (44 percent over this ten year period) and the proportion of surgery taking place in the outpatient setting (49 percent in 1989, up from 14 percent in 1979.) As a result of simultaneous growth in outpatient and the decline in inpatient activity, outpatient revenues as a proportion of all revenues grew from 12 percent in 1979 to 21 percent in 1989.

In addition, fewer alternative providers are available in rural settings than in urban areas. Rural hospitals, therefore, may provide the services that would be provided in urban freestanding settings, such as ambulatory surgery and imaging centers. Freestanding providers are less frequently found in rural areas because their higher fixed costs and required profit margins that cannot be sustained by rural volume. For example, over 85 percent of ambulatory surgery centers are located in urban areas. Among rural hospitals, smaller hospitals are less likely to offer ambulatory surgery services than larger rural hospitals, reflecting the lack of sufficient volume to attract and keep surgeons.[4]

Small, mostly rural, hospitals have larger proportions of ancillary department revenues that are generated by outpatient visits than larger hospitals (Table D-3). For example, radiology revenues generated from outpatient visits made up 70 percent of total revenues in small hospitals in 1988, compared with 44 percent in large hospitals.

Another example of the disparity in the providers available in rural and urban areas is the availability of mammography facilities. While there are more mammography machines in urban areas, the per capita rates do not differ substantially. However, the location of these machines is quite different: in rural areas, over 70 percent of mammography facilities are located in the hospital, compared with only 34 percent in urban areas. Conversely, over 48 percent of the machines in urban areas are located in radiologists' offices and clinics, compared to 11 percent in rural areas.

Another important component of outpatient care in rural areas are community health centers (CHCs). Although the number of CHCs receiving federal grants has declined, the number of actual sites of care has remained about the same. They were originally intended to provide preventive services. Current services offered are not well documented. Many have had to cut back on services supplementing basic primary services that are not covered by insurance. Many CHCs have become certified rural health clinics, allowing them to receive cost-based rates from Medicare and Medicaid.[5] Although envisioned to be a more widespread program, only about one quarter of the qualifying counties have such a facility.

In summary, rural hospitals play a larger role in providing care in rural areas than their urban counterparts. Lacking alternative freestanding providers, these roles are taken on by the local hospital, often acting as an ambulatory surgery center, an imaging center, and a referral lab as well as an inpatient facility. Combined with the decline in inpatient use, rural hospitals increasingly rely on outpatient revenues for a substantial portion of their total budgets. The impact on rural facilities of future outpatient payment policy reform will need to be assessed and monitored.

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[4] OTA, op.cit., Table 5-11, page 123.

[5] To qualify as a certified rural health clinic, a provider must have a mid-level practitioner 50 percent of the time and be located in a medically underserved area or Health Manpower Shortage Area.

Table D-3. Proportion of Revenues Generated By Outpatient Visits in Selected Ancillary Departments, By Bedsize, 1984-1988

Ancillary Department By Hospital Bed Size	1983	1986	1988	Percent Change 1980-1988
Radiology				
<50 beds	52%	65%	70%	35%
50-74 beds	48	63	68	42
300-399 beds	39	47	52	33
>400 beds	33	40	44	33
Laboratory				
<50 beds	23	36	42	83
50-74 beds	19	31	38	100
300-399 beds	15	20	23	53
>400 beds	13	16	20	54
Medical supplies				
<50 beds	13	21	28	115
50-74 beds	11	19	26	136
300-399 beds	5	7	8	60
>400 beds	4	5	4	0
Physical therapy				
<50 Beds	53	71	75	42
50-74 Beds	42	63	73	74
300-399 Beds	27	38	37	37
>400 Beds	21	31	32	52

SOURCE: ProPAC analysis of American Hospital Association Monitrend data.

Skilled Nursing and Home Health Care

Though generally available, skilled nursing and home health providers in rural areas tend to offer fewer specialized services and be less comprehensive than those in urban areas. Nursing home care is generally available through distinct-part nursing homes or free-standing facilities. However, rural hospitals with fewer than 50 beds can also designate swing beds that can be used for both acute and post-acute skilled level care. In 1988, 1,100 hospitals were participating in the swing bed program. In total, there were approximately 53 nursing home beds per 1,000 elderly persons in rural areas, and 42 beds per 1,000 elderly in urban areas in 1987. However, the higher number of nursing home beds masks the distribution of facilities within rural and urban areas. While 12 percent of rural counties had no nursing home, only 4 percent of urban counties had no nursing home. Additionally, rural areas are far more likely to have intermediate level nursing home beds and less likely to have skilled nursing beds than urban counties. In rural areas, 16 percent of the nursing home beds were certified as Medicare skilled level, while 29 percent of the nursing home beds in urban areas were certified as Medicare skilled.[6]

The average number of home health agencies per county in 1987 was 4.5 in urban areas, and only one in rural areas. Agencies were not evenly distributed among counties; they were

[6] Dubay, Lisa. *Explaining Urban - Rural Differences in SNF Benefit Use.* Working Paper 3971-08. The Urban Institute. June 1991.

located in 87 percent of urban counties and only 65 percent of rural counties.[7] However, the catchment area for home health agencies may encompass a geographic area larger than a county, so that a smaller number of residents of counties may lack access to home health services. In 1987, 32 percent of home health agencies located in rural areas were hospital-based, compared to 20 percent in urban areas. Home health agencies located in rural areas tend to be smaller and offer a less comprehensive range of services. For example, 65 percent of home health agencies in rural areas did not offer occupational therapy services, three times the proportion of home health agencies in urban areas not offering occupational therapy services.[8]

Physician Services

There is a mutually dependent relationship between availability of physicians and hospitals and other health care facilities. The existence of a hospital is often necessary to attract physicians to practice in rural areas, at the same time, physicians are also necessary to the viability of rural hospitals because physicians admit and care for patients. While primary care physicians are important in rural areas, the existence of adequate numbers of specialists, such as surgeons, is often necessary to generate sufficient admissions for the hospital to remain viable. However, the relationship between physicians and hospitals is not always as collaborative as their mutual need might indicate. Sometimes, hospitals and physicians compete to provide ancillary services such as x-ray, laboratory, and other outpatient services.

The overall supply of physicians has increased significantly since the early 1970s both in urban and rural areas. By 1979, almost every town with a population over 2,500 had access to a physician.[9] In fact, 96 percent of the population in those towns was within 10 miles of a physician.

More recent research found that in all rural areas, physician supply (which includes MDs and DOs) increased between 1975 and 1985.[10] In small towns, defined as those with a population less than 2,500, the number of physicians per capita increased 13.7 percent since 1975, compared with an 11.7 percent increase in larger towns (defined as those with populations between 5,000 to 9,999). The increase in physicians also occurred in areas with very low population density. In frontier areas, which have less than 6 persons per square mile, the number of physicians per capita increased 18.6 percent between 1975 and 1985. In addition, the number of board certified physicians in rural areas has increased. In 1975, only 18 percent of physicians practicing in rural areas were board certified, compared to 50 percent in 1985.[11]

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[7] Kenney, Genevieve. *The Provision of Home Health Services: Is it a Problem in Rural Areas?* Working Paper 3971-02. The Urban Institute. May 1991.

[8] Ibid., 1990.

[9] Joseph Newhouse and others, "Where Have All the Doctors Gone?" *Journal of the American Medical Association* 247(17): 2392-2396. May 1982.

[10] Kindig, David A. and Hormoz Movassaghi, "Physician Supply in Small Rural Counties." *Health Affairs* 8(2): 63-76. Summer 1989.

[11] Ibid.

In spite of these dramatic gains in the number of physicians, many rural communities still do not have sufficient physicians. In 1988, 111 rural counties had no physician at all. There were still 1,944 areas designed as Health Manpower Shortage Areas in 1988; an estimated 4,104 physicians would be needed to remove these designations.[12] Further, the existing physician supply in rural areas is somewhat precarious. Physicians 65 and older made up 16 percent of all practicing physicians in 1985.[13] A 1988 survey of 550 rural physicians found that 26 percent thought they would be leaving their practice within 5 years. Half of these physicians were under 45 years of age.[14] Given the existing shortage of physicians in rural areas, the potential loss of significant numbers of physicians raises concerns about future physician availability in rural areas.

In addition to the potential loss of existing physicians in rural areas, there is evidence to indicate an increasing inability to recruit physicians in rural areas. Graduates of allopathic medical schools (MDs) increasingly express a reluctance to practice in rural areas. In 1979, 3 percent of graduates indicated they would prefer to practice in small towns or rural areas, compared to only 1.5 percent in 1989. Therefore, the difference between urban and rural physicians per capita, which had begun to lessen, may continue to be a problem.

Other Health Professionals

In view of the precarious nature of the supply of primary care physicians in rural areas it is important to look at the availability of other health professionals, such as nurse practitioners (NPs), physicians assistants (PAs), and certified nurse midwives (CNMs), who may be capable to meeting a majority of health needs. The decline in their supply raises further concerns regarding manpower availability.

The proportion of NPs practicing in rural areas decreased slightly between 1984 and 1988. In 1988, only 15.8 percent of nurse practitioners were in rural areas, compared with 18 percent in 1984.[15] The proportion of PAs in rural areas also declined. In 1989, only 20 percent of PAs were practicing in very small communities (e.g., less than 10,000 residents), compared to 27 percent in 1981.[16] State practice acts often hinder the effectiveness of other health professionals to substitute for physicians in rural areas; many states do not grant them prescription authority or allow them to practice without the direct supervision of a physician. In some cases, states have granted expanded practice authority but no funds were authorized to pay for their services. However, OBRA 1990 authorizing Medicare payment to NPs and certified nurse specialists in rural areas, may remove some of the financial barriers to service.[17]

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[12] OTA, op.cit., page 220.

[13] Kindig, David A. and Hormoz Movassaghi, op.cit.

[14] OTA, op.cit., page 248.

[15] Ibid., p. 251.

[16] Ibid., p. 254.

[17] Physician Payment Review Commission, *Annual Report to Congress, 1991* (Washington, D.C., 1991), page 329.

A recent study of hospital-based nurses found that rural areas had less than 70 percent of the national average of nurses per capita. When the ratio of nurses to inpatient hospital days is examined, rural areas have only 42 percent of the national average.[18] Physical therapists are currently in short supply nationally, and there are potential shortages in the supply of many other allied health professionals, especially radiologic technicians, occupational therapists, and medical records technicians.[19] The problems caused by the shortage of the supply of these professionals is exacerbated in small rural facilities, because many cannot support a full-time position, and may not be able to recruit part-time workers. Anecdotal evidence suggests that some rural hospitals are already experiencing critical shortages of these personnel.[20]

SUMMARY

Rural residents tend to be older, sicker, and poorer than urban residents. They are also less likely to be privately insured. Many rural hospitals are highly dependent on Medicare and Medicaid for their revenues. Like all hospitals, rural facilities have shifted a large part of their business to the outpatient department. Small hospitals (under 50 beds and mostly rural) have experienced the largest increases in outpatient visits. This larger component of outpatient business is due to rural hospitals having had a larger decline in inpatient activity, and there being fewer free-standing competitors.

Subacute services, such as skilled nursing and home health, are generally available in rural areas. As with outpatient care, the rural hospital may play a large part in the provision of these services. For example, in 1987 one-third of home health facilities in rural areas were hospital-based, compared to 20 percent in urban areas. Rural hospitals may provide skilled nursing services, either through a distinct-part unit or swing beds.

Health manpower shortages are extremely critical in rural areas. Although the overall supply of physicians has increased substantially in the last two decades, the increased supply has not kept up with demand in rural areas. In 1988, there were still almost 2,000 areas designated as Health Manpower Shortage Areas; over 4,000 physicians would be needed to remove these designations. There is also a shortage of registered nurses in rural areas; the per capita supply of hospital-based RNs in rural areas is only 70 percent that of the national average. Rural hospitals are also experiencing critical shortages of allied health personnel, such as physical therapists and medical records technicians.

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[18] Kindig, David A. and others. "Changes in Supply and Distribution of Rural Hospital Based Nurses, 1981-1986." Unpublished paper, 1991.

[19] OTA, op.cit., page 283.

[20] Ibid., p. 283.

Appendix E. A Profile of Rural Hospitals

INTRODUCTION

As medical care becomes increasingly sophisticated, rural hospitals may play a smaller role in the delivery of acute care. This may be due to a patient volume that is too low to support the purchase, maintenance, and staffing of sophisticated equipment. It may also be due to the relative absence of physicians with highly specialized training, and other trained staff necessary to support technologically-intensive care. If hospitals in rural areas are unable to provide desired services, local residents may bypass nearby hospitals in favor of urban hospitals. Patients are increasingly traveling to urban areas and rural referral centers for surgical and technologically-intensive services. As a result, inpatient occupancy rates are low in many rural hospitals. These hospitals may wish to consider reconfiguration of their capacity to increase their outpatient services, long-term care, or other non-acute care services.

Rural hospitals are not homogeneous. Rural referral centers generally have a large number of beds and more closely resemble urban hospitals in many respects. Sole community hospitals are accorded special PPS payment status to help maintain beneficiary access to care. In theory, these hospitals may offer more comprehensive services than other rural hospitals because they are supposed to be the major providers of care for the local residents. Finally, frontier hospitals (counties with six or fewer persons per square mile) may not have the volume necessary to maintain a wide scope of services.

This appendix provides descriptive information on rural hospitals -- the services they provide, the share of capacity devoted to specific units, and their utilization of capacity.[1] Characteristics of rural referral centers, SCHs, and frontier hospitals are highlighted. In addition, because of the potentially important effect of volume on financial performance, this analysis also looks at low volume hospitals.[2]

SERVICES

In 1989, the vast majority of rural hospitals (91 percent) offered a basic set of services usually associated with a hospital, compared with 94 percent of urban non-teaching hospitals (see Table E-1).[3] There was considerable variation among rural hospital groups, by size: rural referral centers were most likely to provide at least these basic services, while small rural hospitals were the least likely (78 percent). Sole community hospitals are much more likely than either small or low volume hospitals to offer these services.

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[1] Data for this analysis was obtained from the 1989 American Hospital Association Annual Survey.

[2] Low volume hospitals are defined as those hospitals with an average daily census in acute care units of less than eight. This category includes one-fourth of all rural hospitals in our sample, 549 hospitals. Almost three-fourths of frontier hospitals are low volume hospitals.

[3] Basic services were defined as an emergency department, general medical/surgical beds (either adult or pediatric), and at least three of the following services--histopathology laboratory, diagnostic radiology, blood bank, therapy services, and outpatient surgery.

Table E-1. Percent of Hospitals Meeting Basic and Full Service Definitions, 1989

Hospital Group	Number of Hospital	Basic Hospital	Full Service Facility
Urban non-teaching	1,348	94%	18%
Rural	2,041	91	11
Rural <25 beds	223	78	2
Rural 25-49 beds	684	86	2
Rural 50-99 beds	642	97	12
Rural 100-149 beds	256	98	23
Rural 150-199 beds	115	100	30
Rural 200+ beds	119	98	31
Rural referral	223	99	30
Sole community	422	92	10
Low volume	549	79	0

SOURCE: ProPAC analysis of American Hospital Association Annual Survey data.

Many fewer rural hospitals met the definition of a full service hospital.[4] Only 11 percent of rural and 18 percent of urban hospitals were classified as full service. Again, the variation across the hospital groups followed size categories: 30 percent of large rural and referral centers, compared with only 2 percent of hospitals with less than 50 beds, were full service hospitals.

The following sections describe each of these service categories in more detail.

Basic Services

In 1989, several basic services -- diagnostic x-ray, emergency departments, therapy services, and outpatient surgery -- were available in virtually all hospitals, rural and urban alike (see Table E-2). Each of these services was offered in more than 90 percent of all hospitals. Basic radiology was the most prevalent, provided by over 98 percent of urban and rural hospitals.

The majority of low volume hospitals provided these basic hospital services as well. Of the four basic services identified above, both basic radiology and emergency departments were found in more than 90 percent of low volume rural hospitals. Outpatient surgery was offered in 85 percent of low volume hospitals and therapy services in slightly less than 80 percent of these hospitals.

[4] Full service facilities are defined here as those hospitals that provide specialized and complementary services, have at least five subacute care beds, and offer outpatient facilities -- in addition to meeting the basic hospital criteria. Specialized services are defined as intermediate radiology, cardiac catheterization, trauma center, and open heart surgery. Complementary services include: outpatient alcohol or chemical dependency, home health, hospice, psychiatric, or social work services.

Table E-2. Percent of Hospitals Offering Basic Services, 1989

Hospital Group	Number of Hospitals	Basic Radiology	Emergency Department	Therapy Services	Outpatient Surgery	Blood Bank	Histopathology
Urban non-teaching	1,348	99%	95%	97%	98%	75%	80%
Rural	2,041	98	97	92	94	61	44
Rural <25 beds	223	98	95	78	80	45	18
Rural 25-49 beds	684	98	95	86	91	52	20
Rural 50-99 beds	642	99	99	97	98	61	46
Rural 100-149 beds	256	99	99	99	99	75	78
Rural 150-199 beds	115	100	100	100	100	85	94
Rural 200+ beds	119	97	99	99	100	89	96
Rural referral	223	98	100	100	100	86	93
Sole community	422	98	99	90	91	60	37
Low volume	549	97	94	79	85	45	13

SOURCE: ProPAC analysis of American Hospital Association Annual Survey data.

Two other services -- histopathology laboratories and blood banks -- proved to be less widespread, especially in rural hospitals. Forty-four percent of rural hospitals reported having a histopathology laboratory, in contrast to 80 percent of urban hospitals. Blood banks were reported by slightly more than 60 percent of rural hospitals and 75 percent of urban hospitals. Because these services are often essential to the provision of hospital care, these figures suggest that other health care providers or nonspecialized hospital units frequently provide these services to some hospitals.

In assessing the prevalence of services offered in rural hospitals by hospital category, several consistent patterns emerge. First, rural referral centers are much more likely to offer a given service than sole community hospitals or other rural hospitals. In fact, rural referral centers are frequently more likely to provide a service than urban hospitals. For example, more than 90 percent of rural referral hospitals had histopathology laboratories, while only 80 percent of urban hospitals provided this service. Frontier hospitals are least likely to offer a given service. For example, only 18 percent had histopathology laboratories.

These variations, however, are likely due less to location than to size. The service offerings of rural and urban hospitals of the same size are frequently quite similar. For example, about 80 percent of both rural and urban hospitals with 100 to 149 beds had histopathology laboratories. Hospitals with 200 or more beds were equally likely to provide this service, regardless of location. Overall, the likelihood of a hospital offering a specific service increases with size.

Last, low volume hospitals are less likely to offer a given service than other rural hospitals in general. This is due in part to the fact that larger rural hospitals and rural referral centers -- the rural hospitals most likely to provide services -- are not low volume hospitals. Only 45 percent of low volume hospitals had blood banks and only 13 percent reported histopathology laboratories.

Specialized Services

Rural hospitals, with the exception of rural referral centers and large facilities, did not generally offer specialized services (see Table E-3). Overall, 11 percent of rural hospitals had intermediate radiology capabilities.[5] Cardiac catherization laboratories were found in 5 percent of rural hospitals, as were trauma centers. Only one percent of rural hospitals performed open heart surgery. In contrast, 36 percent of urban hospitals have intermediate radiology, 29 percent have cardiac catherization laboratories, 11 percent have trauma centers, and 16 percent perform open heart surgery.

Table E-3. Percent of Hospitals Offering Specialized Services, 1989

Hospital Group	Number of Hospitals	Intermediate Radiology	Cardiac Catherization Lab	Trauma Center	Open Heart Surgery
Urban non-teaching	1,348	36%	29%	11%	16%
Rural	2,041	11	5	5	1
Rural <25 beds	223	1	1	2	0
Rural 25-49 beds	684	2	0	2	0
Rural 50-99 beds	642	4	2	3	0
Rural 100-149 beds	256	20	9	9	1
Rural 150-199 beds	115	43	10	14	1
Rural 200+ beds	119	71	48	22	19
Rural referral	223	57	35	22	12
Sole community	422	5	1	5	0
Low volume	549	0	1	1	0

SOURCE: ProPAC analysis of American Hospital Association Annual Survey data.

Large rural hospitals (those with 200 or more beds) are much more likely to provide these specialized services. For example, more than 35 percent of rural referral centers and nearly one-half of large rural hospitals had cardiac catherization labs. This may suggest that hospitals need to be of a certain size to make the service viable.

Almost without exception, low volume hospitals do not provide specialized services. Of the specialized services discussed above, not more than one percent of low volume rural hospitals offered these services. None of these hospitals performed open heart surgery.

Complementary and Outreach Services

Given rural hospitals' declining volumes, diversification into non-acute services may allow hospitals to more fully utilize their existing capacity and increase PPS-exempt revenues.

[5] Hospitals were considered to have intermediate radiology capabilities if they provided at least one of the following: radioactive implants, therapeutic radioisotope, or x-ray radiation therapy.

Social work was the most common complementary service offered in rural hospitals in 1989, reported by almost one-half of rural hospitals (see Table E-4). Among rural hospitals, rural referral centers and large hospitals were most likely to provide this service. Small rural hospitals and frontier hospitals were least likely to provide social work services.

Table E-4. Percent of Hospitals Providing Complementary Services, 1989

Hospital Group	Number of Hospitals	Alcohol/Chemical Dependency Outpatient	Home Health Services	Hospice	Psychiatric Services	Social Work Services
Urban non-teaching	1,348	25%	33%	16%	48%	74%
Rural	2,041	11	36	13	25	49
Rural <25 beds	223	3	26	10	14	27
Rural 25-49 beds	684	6	32	9	13	30
Rural 50-99 beds	642	10	36	12	22	52
Rural 100-149 beds	256	17	43	15	43	75
Rural 150-199 beds	115	23	50	19	53	85
Rural 200+ beds	119	29	50	32	72	92
Rural referral	223	26	51	28	68	89
Sole community	422	7	39	11	21	42
Low volume	549	4	29	7	21	21

SOURCE: ProPAC analysis of American Hospital Association Annual Survey data.

Home health is one of the few services found more frequently in rural hospitals than in urban hospitals. Rural hospitals were more likely than urban non-teaching hospitals to provide home health services within each size category. The higher incidence of home health services may indicate the lack of non-hospital based providers in rural areas.

One-fourth of all rural hospitals offered psychiatric services. Slightly more than one in 10 rural hospitals had an alcohol/chemical dependency outpatient department, ranging from 3 percent for small rural hospitals to 29 percent in large rural hospitals. Hospices were found in 13 percent of rural hospitals.

The likelihood of a low volume rural hospital offering a specific complementary services was roughly half that for rural hospitals in general. The exception was home health services, which were provided in 29 percent of low volume rural hospitals.

CAPACITY AND UTILIZATION

On average, rural hospitals have fewer beds, lower average daily censuses, and lower occupancy rates than urban hospitals. However, there is considerable variation among groups of rural hospitals. For example, sole community hospitals tend to be smaller, treat fewer patients, and have lower occupancy rates than the average rural hospital. Occupancy rates tend to increase with hospital size. Additionally, certain units are more prevalent and more fully utilized in rural hospitals than urban hospitals.

In addition to providing acute care, many hospitals provide long-term care or have psychiatric or alcohol/chemical dependency units. Rural hospitals that provided only acute care generally were smaller than the average rural hospital and had lower occupancy rates. Rural hospitals with both acute care and long-term care units were slightly smaller than average, but had higher than average occupancy rates. Hospitals providing both acute and psychiatric or alcohol/chemical dependency units, however, tended to be almost twice as big as the average rural hospital and had higher occupancy rates.[6] Hospitals that provide some type of nonacute care appear to be making better use of their capacity. Overall, these findings may encourage hospitals that currently do not offer nonacute services to consider service reconfiguration and downsizing.

Acute Care Units

In 1989, acute care beds accounted for 83 percent of hospital capacity in rural hospitals, which was slightly lower than in urban hospitals (see Table E-5). Acute care capacity was more fully utilized in urban than in rural hospitals. With an average daily census of 32 in an average of 66 beds, acute care occupancy rates in rural hospitals averaged 48 percent. Urban hospitals reported an average daily census of 95 and a 62 percent occupancy rate.

Table E-5. Capacity And Utilization of Acute and Long-Term Care Units

	Acute Care			Long-Term Care*		
Hospital Group	Percent of Total Beds	Average Number of Beds	Occupancy Rate	Percent of Total Beds	Average Number of Beds	Occupancy Rate
Urban non-teaching	86%	153	62	24%	43	77
Rural	83	66	49	47	35	66
Rural <25 beds	69	28	32	65	31	71
Rural 25-49 beds	82	33	30	54	32	63
Rural 50-99 beds	86	58	43	43	37	62
Rural 100-149 beds	86	100	52	29	41	71
Rural 150-199 beds	87	140	58	17	38	82
Rural 200+ beds	86	224	64	14	39	79
Rural referral	86	178	62	16	38	76
Sole community	79	48	42	50	31	65
Low volume	75	25	20	60	31	65

* These statistics are for the hospitals that reported long-term care beds. On average, 62 percent of rural hospitals had long-term beds. This percentage decreases with bed size.

SOURCE: ProPAC analysis of American Hospital Association Annual Survey data.

Acute care beds comprised 75 percent of total capacity in rural low volume hospitals. These hospitals had an average daily census of five and average occupancy rates slightly below 20 percent in acute care units. If these hospitals are necessary to maintain access, reconfiguration may improve their overall utilization.

[6] Forty-seven percent of rural hospitals that had acute and psychiatric or alcohol/chemical dependency units also provided long-term care. Thirteen percent of hospitals with long-term care and acute care units also provided psychiatric or alcohol/chemical dependency units.

Rural hospitals were less likely than urban hospitals to have only acute care units. Slightly more than one in four rural hospitals offered only acute care units. In contrast, 40 percent of urban hospitals provided only acute care. Smaller hospitals, sole community hospitals, and frontier hospitals were least likely to exclusively offer acute care. For example, only 14 percent of sole community frontier hospitals had only acute care units. The share of rural hospital capacity devoted to acute care increased steadily with overall bed size from 69 percent for small hospitals to 86 percent for large hospitals. These figures suggest that, in general, rural hospitals -- especially smaller rural hospitals -- have diversified their service mix.

Acute Care Subunits

The acute care unit can be broken down into several subunits -- including general medical/surgical, obstetrics, and intensive care (see Table E-6). Virtually all hospitals provide general medical/surgical beds. This unit comprised roughly 70 percent of total beds in both rural and urban hospitals. However, occupancy rates were higher in urban than rural hospitals. Thus, rural hospitals did not utilize their capacity to the same degree as urban hospitals. Small rural hospitals had especially low occupancy rates. On average, not more than one-third of their general medical/surgical beds were occupied throughout the year.

Table E-6. Percent Providing and Occupancy Rates of Acute Care Subunits, 1989

	General Medical/Surgical[a]		Obstetrics		General Intensive/ Cardiac Intensive Care	
Hospital Group	Percent Providing Beds	Occupancy Rate[b]	Percent Providing Beds	Occupancy Rate[b]	Percent Providing Beds	Occupancy Rate[b]
Urban non-teaching	100%	63%	67%	51%	88%	66%
Rural	100	49	62	36	63	51
Rural <25 beds	100	33	40	23	31	34
Rural 25-49 beds	100	30	45	20	39	26
Rural 50-99 beds	100	43	68	31	74	42
Rural 100-149 beds	100	55	88	37	91	54
Rural 150-199 beds	100	60	90	43	97	57
Rural 200+ beds	100	66	90	51	98	66
Rural referral	100	64	91	47	96	63
Sole community	100	43	68	30	64	41
Low volume	100	19	40	11	26	34

[a] Includes adult and pediatric beds.

[b] Occupancy rates are for the hospitals that reported beds in this unit.

SOURCE: ProPAC analysis of American Hospital Association Annual Survey data.

Rural hospitals are less likely than urban hospitals to provide obstetric care, and those that do have low obstetric unit occupancy rates. More than two-thirds of urban hospitals had obstetric units compared to 63 percent of rural hospitals. Rural hospitals, on average, had one-half the number of obstetric beds but an average daily census that was only about one-third of the total for urban hospitals. For both rural and urban hospitals that offered an obstetrics unit, the share of obstetric beds was about 10 percent.

About 90 percent of rural referral centers and large rural hospitals had obstetric care units. Sixty-eight percent of rural sole community hospitals reported obstetric care units. Obstetric care was found in 40 percent of low volume rural hospitals and the average daily census in these units for those hospitals that provided them was less than one.

Roughly the same proportion of rural hospitals had general intensive or cardiac intensive care units (ICUs) as obstetrics units, although ICUs were more prevalent than obstetric units in urban hospitals.[7] Occupancy rates were, on average, higher in ICUs than in obstetrics units. Again, for those hospitals that had an ICU, the share of beds was constant (seven percent) for all types of hospitals. More than 96 percent of rural referral centers and large rural hospitals had an ICU, while 64 percent of sole community hospitals had such units. Only 26 percent of low volume rural hospitals had an ICU and the average daily census for those hospitals that had an ICU was less than one.

The difference in the percentage of rural hospitals offering other special care units -- e.g., neonatal intensive care, burn care -- compared to urban hospitals was even greater. Only 9 percent of rural hospitals had other special care units versus more than 25 percent of urban hospitals.

Long-Term Care Units

Long-term care units, which include skilled nursing care, intermediate care, rehabilitation care, and swing beds, were more widespread among rural hospitals than urban hospitals. Sixty-two percent of rural hospitals provided long-term care, in contrast to 34 percent of urban hospitals. Moreover, of those hospitals that have long-term care units, long-term beds accounted for nearly one-half of total facility capacity in rural hospitals as opposed to approximately one-fourth of capacity in urban hospitals (see Table E-5). Sole community hospitals were more likely to provide long-term care services, as were frontier hospitals. Unlike acute care services, rural referral centers were least likely to provide long-term care, only 37 percent of them did so, and in these hospitals such units accounted for only 16 percent of capacity.

The likelihood of having long-term care units declined as size increases, from roughly three-fourths of small rural hospitals to 36 percent in large rural hospitals. Low volume rural hospitals were especially reliant on long-term care to maintain utilization. Eighty-one percent of low volume hospitals provided long-term care. Of those that did offer these units, long-term beds accounted for 60 percent of capacity, with an average 65 percent occupancy rate.

Although occupancy rates for long-term care units were lower in rural hospitals (66 percent) than in urban hospitals (77 percent), long-term care occupancy rates in rural hospitals were still higher than those for rural acute care units (49 percent).

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[7] Hospitals that provide obstetric units do not necessarily provide ICUs, however, and vice versa. Fewer than one-half of rural hospitals offering basic services had both ICUs and obstetric units. Smaller hospitals were slightly less likely to have ICUs than obstetrics, while larger hospitals were more likely to have an ICU.

Also of interest is the composition of average daily census for small rural hospitals that provide long-term care units. Overall, these hospitals had an average daily census of 28. On average, about 23 of these patients were in long-term care units, leaving only five patients in the hospital's acute care unit.

In summary, low volume and small rural hospitals were most likely to provide long-term care units. Previous studies suggest that hospitals that have highly-utilized and profitable acute care services are not as likely to provide long-term care.[8]

Psychiatric and Alcohol/Chemical Dependency Subacute Care Units

Eighteen percent of rural hospitals offered psychiatric or alcohol/chemical dependency subacute units, compared to over 40 percent of urban hospitals. The share of total capacity comprised by these units, when they were provided, was about 18 percent for both urban and rural hospitals. Rural referral centers and large rural hospitals were most likely to provide psychiatric or alcohol/chemical dependency subunits. Only 7 percent of small rural hospitals offered these units, but when they did the unit accounted for 22 percent of total capacity.

Two-thirds of the psychiatric and alcohol/chemical dependency subacute beds were occupied in rural hospitals, which was slightly higher than in urban hospitals (63 percent). Interestingly, rural hospitals with 25 to 49 beds had the highest share of capacity devoted to these units (33 percent) and the highest occupancy rate (84 percent) of any hospital group. Again, for those hospitals that provide psychiatric and alcohol/chemical dependency beds, occupancy rates were, on average, higher in these units than in acute care units. Psychiatric and alcohol/chemical dependency subacute units in rural hospitals with less than 100 beds had occupancy rates that were 12 to 20 percent higher than those of acute care units.

Only four percent of low volume rural hospitals have psychiatric or alcohol/chemical dependency units. Of those that do, however, occupancy rates were 70 percent.

SUMMARY

This analysis found that rural hospitals, as a group, offered fewer services than urban hospitals in 1989. The services offered tend to be less technologically-sophisticated and acute care plays a smaller role in their total facility. Instead, rural hospitals are more likely to have long-term care units.

For the most part, rural hospitals provided at least a minimum set of services that might be considered essential to a hospital. The vast majority of rural hospitals offered basic services. However, few rural hospitals offered specialized services or could be classified as full service facilities according to the definition used in this analysis.

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[8] Office of Technology Assessment, *Health Care in Rural America*, (Washington, DC: U.S. Government Printing Office, September 1990), page 116.

Some rural hospitals provided complementary services, such as psychiatric services. This may indicate that rural hospitals are diversifying into new areas of service. These services were less prevalent in low volume and small rural hospitals than in other rural hospitals.

Rural hospitals had relatively low occupancy rates in acute care units. Low occupancy may indicate room to convert or downsize hospital facilities. Given that occupancy rates were generally higher in both long-term acute care units and psychiatric and alcohol/chemical dependency acute care units than in acute care units -- especially for low volume and small rural hospitals -- expanding these two areas may be one way for rural hospitals to increase utilization.

Long-term care units played a notable role in rural hospitals. Most rural hospitals had long-term care units. The likelihood of a hospital having a long-term care unit was associated with size, with smaller hospitals more likely to provide these units. Low volume rural hospitals also had a relatively high incidence of long-term care units. In rural hospitals with less than 50 beds that provide long-term care, the average daily census in long-term care units was at least twice that of acute care units.

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